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ABSTRACT

This report describing the current and future use of online automation technology in Connecticut libraries provides recommendations designed to assist Connecticut libraries in making more effective use of current systems, in selecting the most appropriate new systems, and by providing a basis for effective statewide planning that will take advantage of current and future automation technology. The report is presented in four major parts: (1) the introduction and executive summary, containing an overview, a description of the report audience, and priorities for readers; (2) current systems and the need for a statewide database describing the existing automation environment and defining the key component for future automation activities; (3) current plans and future systems, describing the current commercial and not-for-profit automated services and planned extensions to these services; and (4) 1980-1985: a five-year plan, defining the specific actions, projects, committees, task teams, etc. required to carry out report recommendations. (Author/RAA)

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THE USE OF ON-LINE TECHNOLOGY

IN CONNECTICUT LIBRARIES

1980 - 1985

by
Hank Epstein
Susan Baerg Epstein

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May, 1980
Information Transform Industries
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PART I

INTRODUCTION AND EXECUTIVE SUMMARY

Chapter 1

INTRODUCTION

1.1 OVERVIEW

1.1.1 Purpose of the Report

This report describes the current and future use of on-line automation technology in Connecticut libraries. The cost of operating libraries is increasing with inflation and the cumulative innefficiencies of certain manual systems. Automation in libraries is the only currently available operations and management tool that has the potential benefit of slowing down these increasing costs; in some cases the actual costs of certain operations may be reduced as a result of automation. Another major advantage of automation is the potential for dramatic improvement in library services for the library patron and library staff; improvements in library services through resource sharing can be achieved on a local, regional, statewide, and national level as a direct result of automation.

With shrinking library budgets and high levels of inflation, libraries of all types must not only adopt, but share the use of technology in order to serve their patrons. Without technology, increasing personnel and material costs may force the curtailment of some current services and prevent the introduction of new services to respond to a rapidly changing world. The investment of funds now will moderate the growth of operating expenses in the future. The purpose of this report is to provide recommendations which will permit Connecticut libraries to make more effective use of current automated systems, select the most appropriate new systems, and provide a basis for effective statewide planning which will take advantage of current and future automation technology.

1.1.2 Outline of the Report

The chapters in this report are presented in four major parts; Part I consists of the Introduction and Executive Summary. The Introduction (Chapter 1) contains an overview of the report, a description of the report audiences, and suggests reading priorities for the different report audiences. The Executive Summary (Chapter 2) is a non-technical summary of the major issues and recommendations of the report.

Part II, Current Systems and the Need for a Statewide Data Base, describes the existing automation environment in Connecticut and defines the key component for future statewide automation activities. The Background (Chapter 3) describes current automation in Connecticut libraries and the value and uses of a statewide data base. On-Line Catalogs (Chapter 4) defines an on-line catalog, its uses, potential sources and schedules, the future of the on-line catalog, and methods to prepare for this service. The Data Base (Chapter 5) describes methods of building the initial and future versions of the statewide data base, the potential sources of data, and detailed uses of the data base.

Part III, Current Plans and Future Systems, describes the current major commercial and not-for-profit automated services and planned extensions to these services; most of the development now in process will be completed in the 1980 - 1985 period. Recommendations on the selection and use of these automated services are included in each chapter. Circulation Systems (Chapter 6) describes a multi-vendor environment and a detailed outline for the selection and acquisition of turnkey systems. Bibliographic Utilities, Brokers, Vendors, and Consortium (Chapter 7) describes cataloging systems and the possibility of future regional, statewide, and multistate services. Acquisition Services (Chapter 8) describes potential sources for future acquisition systems and currently available book ordering systems. Serials Systems and Search Services (Chapter 9) describes the availability of serials cataloging and checkin systems, recommendations for generation of a statewide union list of serials, and the cooperative use of commercial services. Additional Recommendations (Chapter 10) contains recommendations not covered by the previous chapters, and are grouped by type of library.

Part IV, 1980 - 1985: A Five Year Plan, defines the specific actions, projects, committees, task teams, etc. required to carry out the report recommendations. Introduction to the Plan (Chapter 11) defines a methodology for project definition and control and some general comments about schedules. Tasks for 1980/81 (Chapter 12) describes the formation

of the Automation Coordinating Committee and several task forces, and specific projects for the State Library, University of Connecticut (UCONN), public libraries and Cooperative Library Service Units (CLSUs), state colleges, and other agencies. Tasks for 1981/82 (Chapter 13), Tasks for 1982/83 (Chapter 14), and Tasks for 1983/84 and 1984/85 (Chapter 15) follow the same general pattern.

1.2 THE REPORT AUDIENCES AND REPORT PRIORITIES

1.2.1 Library Board Members and Trustees

This report is directed at three different audiences: library board members and trustees, library administrators, and senior staff involved with automation. The Executive Summary (Chapter 2) is directed towards board members and trustees and contains a non-technical review of the entire report, highlighting the major issues and recommendations. Board members and trustees should briefly scan Part II (Chapters 3 - 5) for a review of current automation in Connecticut and the use of a statewide data base, and Part III (Chapters 6-10) for a review of current and future systems; a careful review should be given to the "Recommendation" portions of these chapters. Board members and trustees should pay particular attention to that portion of Part IV, The Five Year Plan (Chapters 11-15) that is directed towards their organization; a brief review of the projects of other organizations may place their own organization's tasks, projects, schedules, and budgets in perspective.

1.2.1.1 Impact of the Recommendations

The implementation of these recommendations require a considerable amount of staff work on the part of the libraries; the implementation expenses of labor, capital, and vendor costs range from a few thousand dollars to several hundred thousand dollars. The allocation of these dollars on certain statewide projects will produce automated resources which will dramatically reduce the cost of future activities in individual libraries by many orders of magnitude. The earlier these projects are completed, the greater the return. The early availability of budgetary support for the high return projects is a major issue.

1.2.2 Library Administrators

Library administrators should review the entire report in detail. Portions dealing with types of automation they are familiar with should be relatively clear; the recommendations can then be evaluated in the context of their own library's current activities. Chapters or sections describing other forms of automation not currently available in their libraries should provide useful background for selecting priorities, initial planning for some selected projects in these new areas, and participating in committees and task forces.

Administrators should review the Executive Summary and portions of the Five Year Plan that deal with their type of library for potential impact on their libraries; libraries planning to acquire a circulation system, as a single library or as part of a consortium, should carefully review the sections on Selection Considerations (6.2) and the Selection Process (6.3) in the Circulation chapter. Planning for a future on-line catalog (Chapter 4) and early participation in the statewide data base (Chapters 3 and 5) are also high priority items for administrators.

1.2.3 Senior Library Staff Involved with Automation

The library staff should review the entire report to appreciate the dimensions and magnitude of statewide and individual library activities. Special attention should be given to the particular areas of automation in which the staff is, or soon will be, involved; interfaces between automated systems should also be reviewed to determine the potential benefits and costs. All staff should determine the contributions to, the potential uses of, and the benefits of the statewide data base for their library.

Particular attention should be given to the detailed recommendations and examples that apply to their areas of automation. The senior staff will most likely be responsible for defining, designing, implementing, and operating the projects defined in the report as key members of the project task forces.

Chapter 2

EXECUTIVE SUMMARY

This chapter contains a summary of the report, a description of the critical issues, and eight major recommendations. The Executive Summary generally follows the same sequence as the remainder of the report. For additional information on any of these subjects, refer to the report section numbers in parenthesis (i.e. 3.2) listed at the end of each discussion.

In many cases the approximate cost and schedule and recommended responsible agency are presented. The costs and schedules are only meant to convey the magnitude of the effort and may be used for preliminary budgetary and planning purposes; the estimates will tend to become more accurate as more planning is done by the various committees.

In any case, priorities among these activities need to be established (possibly by the Automation Coordinating Committee - see 12.1) in order to make the best allocation of resources, given an available budget. There is a very real need for the libraries to obtain substantial additional funds for automation. Without this investment of funds the cost of providing even traditional library services will rise right along with inflation.

With automation successfully installed in Connecticut libraries, the rise in costs can be held substantially lower than the inflation rate, even (and often) in the presence of additional workload (more patrons, more circulation, etc.). Automation also provides new services at a small fraction of the cost of providing the new service manually; for example, once a statewide data base has been established, the cost of supplying 300 libraries with a copy of a one million title union catalog on microfiche is only $295 per library ($88,500 total). The cost of providing a manual union catalog of one million titles would be many times that cost.

2.1 CURRENT AUTOMATION IN CONNECTICUT LIBRARIES

There is a great deal of automation currently in use in Connecticut libraries.

1. Nineteen public, academic, and special libraries catalog 180,000 titles per year (one title every forty seconds) and receive over one million computer-produced catalog cards from OCLC, a nationwide on-line cataloging network. (3.1.1)

2. Automated interlibrary loan (ILL) using the OCLC system has been implemented during 1979, and Connecticut libraries are beginning to use the system. The OCLC files contain information on over 5 million titles and 50 million copies of library material from over 2,000 libraries throughout the U.S. (3.1.1)

3. Eight public libraries utilize automated on-line circulation systems and circulate over 2,600,000 books and other library materials per year (one book every 4 seconds). One academic library utilizes an on-line circulation system, and another academic library utilizes an automated batch process circulation system. (3.1.2)

2.2 MAJOR ISSUES AND LIMITATIONS - CURRENT SYSTEMS

The current use of automation described above creates some serious limitations and issues when viewed from a statewide perspective.

2.2.1 On-Line Cataloging

Only the 19 OCLC member libraries can take advantage of the 5 million titles in the OCLC files and use these records for cataloging purposes; since the other Connecticut libraries are not members of OCLC, they do not have the ability to search OCLC or other bibliographic files for cataloging information. (3.1.1.4)

2.2.2 On-Line Finding Tool for ILL

Only the same 19 OCLC member libraries can search the OCLC file to locate the 50 million copies of library material needed for ILL; other libraries are not able to search OCLC for this information. (3.1.1.4)

2.2.3 Need for a Statewide Finding Tool

The 800,000 titles cataloged to date on OCLC represent a very small fraction (1% - 10%) of the collection of most of the Connecticut OCLC libraries; the rest of the titles for these libraries, representing the majority of their collections, and all of the titles for most of the non-OCLC libraries, are not known to other libraries throughout the state.

It is vital for every Connecticut library to be aware of the holdings of other Connecticut libraries in order to quickly locate and borrow material, needed by a library patron, that is not available at the patron's library. It is this sharing of library resources among libraries that makes libraries much more cost effective; it is not necessary, or even desirable, for a library to acquire and store all of the available material on all of the subjects and disciplines covered by the library. (3.2)

Once this finding tool is available to patrons and library staff, the demand for material from other Connecticut libraries will increase, making more effective use of library materials in Connecticut and also increasing the demand for Connecticar.

> MAJOR REQUIREMENT: There is a high priority need for a finding tool of all library materials in Connecticut; the finding tool should be available to all libraries in Connecticut at a reasonable cost. A major portion of this report responds to this issue.

2.3 ON-LINE CATALOGS AND COM CATALOGS

The ultimate finding tool to meet the needs described above would be an on-line catalog with files containing bibliographic and holdings information from Connecticut libraries, with terminals in each library to access this file. The general requirements, potential sources, implementation scenarios, and schedules for an on-line catalog are described in Chapter 4; however, the conclusion states that on-line catalogs will not be available for several more years, and therefore the best policy to persue at this time is to plan and prepare for the eventual use of an on-line catalog and make effective use of interim products. (4.4)

2.3.1 COM Catalogs

One of the most effective interim products which could provide most of the benefits of a statewide finding tool is a COM (Computer Output Microfilm) catalog, in either roll microfilm or microfiche form. A COM device actually reads a computer magnetic tape and generates a film master (much like a computer and printer might read a tape and print a report or catalog cards); the film master is reproduced as many times as required for distribution to libraries.

A COM catalog is quite inexpensive compared to an on-line system. An on-line system has the costs of a central computer and files, terminals in each library, and transmission lines to each library; copies of a statewide COM catalog might cost in the range of $200 to $400 per copy plus a microfiche reader for $200. Larger libraries with high usage may wish to obtain mechanized microfilm readers for $800 to $1000 in order to achieve faster access. (4.6)

COST ESTIMATE: $70,000 (200 copies) - $100,000 (400 copies).

COM catalogs would only be updated 1 - 2 times per year due to the cost of the new edition (an additional $70,000 - $100,000); changes occuring between catalog issues would not be available until the next issue of the COM catalog. The statewide COM catalog would be used as a finding tool for interlibrary loan (ILL) and would not replace a library's card catalog, although an individual library could choose to use the statewide data base to produce its local COM catalog on a more frequent basis and use this COM catalog to replace the card catalog.

The nature of the ILL request pattern permits an annual or semi-annual edition; the needs of an individual library, for access information to their own collection, do not.

2.4 THE STATEWIDE DATA BASE

In order to generate a file for an on-line catalog or a COM catalog the information must be available in machine readable form. This is one of the most expensive operations in any automated system. If information is not available it must be keyed in (typed in on a terminal or other input device). As an example, for a circulation system with 150,000 titles in the collection, 150,000 brief titles and detailed holdings information (location, copy, and call number) would be required to be input; a task that would take 5,000 hours or 2 1/2 operator years. If, on the other hand, most of the needed title records existed in machine readable form and were available for extracting and copying into the circulation file, approximately half of the input task (1 1/4 operator years) could be eliminated; this savings could be repeated at each library performing a similar task.

A single, combined, statewide data base (machine readable file) could be generated from data obtained on magnetic tapes from a variety of Connecticut cataloging records including OCLC, circulation records, and other sources. Data extracted from the statewide data base could then be used to generate copies of the entire file (or a portion of the file) for statewide, regional, or individual library catalogs (both on-line or COM catalogs), regional or individual library circulation files, and a variety of other uses. This statewide data base is then the key to cooperative automation activities in Connecticut libraries. (5.)

> MAJOR RECOMMENDATION 1: Connecticut should establish a Statewide Data Base at the earliest possible time, and utilize this data base for statewide, regional, and individual library products.
>
> > COST ESTIMATE: $30,000 (for a one million title data base, including all known Connecticut holdings in machine readable form).

2.4.1 Generating the Initial Data Base

The first version of the statewide data base would be generated by combining existing machine readable records such as OCLC tapes, circulation file tapes, State Library OCR (Optical Character Recognition) tapes, etc. Before the records can be combined or merged the records must be upgraded to the national bibliographic standard (called MARC II Standard Communications format); fortunately, commercial vendors maintain records in the MARC format and have the ability to take a brief user record, match the brief record with the MARC record, and combine the full bibliographic portion of the MARC record with the holdings portion of the user record creating an upgraded record which conforms to national standards. In this way it is possible to combine full cataloging records from OCLC and brief records from circulation files into a statewide data base of uniform high quality.

The resulting regional or statewide catalog would be the highest quality possible rather than being degraded by incomplete or incorrect records. Libraries extracting data for circulation files would also derive the benefits of the improved records. (5.3)

> MAJOR RECOMMENDATION 2: A COM vendor, to perform the record upgrade to MARC and to generate the initial statewide data base and COM catalog, should be selected as soon as possible in 1980 and the upgrade of records to MARC and merging of records to form the initial data base begun in 1980, even with the limited funds available.
>
> COST ESTIMATE: $4,000 - $8,000 (to select the vendor)

2.4.2 Summary of Costs for Statewide Data Base and COM Catalog

1. Selection of COM vendor - $4,000 - $8,000 (Recommendation No. 2)

2. Generation of statewide data base $30,000 - $60,000 (Recommendation No.1)

3. Generation of COM catalogs (first edition) $70,000 (200 copies) - $100,000 (400 copies) (Section 2.3.1)

2.5 INTERIM ON-LINE CATALOG AT UCONN

The UCONN computing center has recently installed new software which could support on-line patron and reference searching of UCONN-Storrs main library collection.

MAJOR RECOMMENDATION 3: If confirmed by a cost/benefit analysis the UCONN library should generate a magnetic tape from the circulation book cards, develop a SPIRES file definition utilizing the information on the book cards, and generate a SPIRES file for the 500,000 - 1,000,000 titles in the main collection. Patron and reference staff should have access to search terminals and utilize the various indexes, output formats, tailored bibliographies, etc., that are available from the system. An evaluation report of the UCONN experiences could be used in library, regional, and statewide planning for future on-line catalogs. (4.7, 12.3)

COST ESTIMATE: Labor to handle book cards: 3 - 5 man years of clerical support, plus supervision

Terminals: $1,000 - $2,000 each

File Building and File Searching: Costs will be a function of the computer resources used (including file storage) and the UCONN data processing computer charges

2.6 CIRCULATION SYSTEMS

Libraries in Connecticut and elsewhere have in the past used a somewhat informal, and partially incomplete, process to acquire automated circulation systems from various vendors. As new systems are acquired, there are expectations that the new systems will support a much larger group of libraries, patrons, and circulation load than was required of the earlier systems; there is now the very real possibility that the new systems will not be able to handle the expected circulation load (which could result in fewer libraries being supported by the system than expected - creating higher costs for the libraries on the system). (6.2)

MAJOR RECOMMENDATION 4: Each library, CLSU, or consortium selecting a circulation system should participate in a formal

selection process including: the generation of system requirements, documentation of an RFP (Request For Proposal), formal evaluation of the vendors, conduct of live benchmark and acceptance tests, and revision of contract terms to protect the library from poor system and vendor performance. (6.3, 6.5)

COST ESTIMATE: $10,000 - $15,000 (per selection, initially),

then $2,000 - $5,000 (per selection, after Major Recommendation No.7 is implemented).

2.7 BATCH UNION LIST OF SERIALS

There are many lists of serial records in Connecticut libraries, primarily in the special libraries and UCONN. Most of the lists are produced on COM or are hardcopy listings of computer printouts; in any case, the master file is in machine readable form. A few libraries have copies of other libraries' serial lists; this is the exception rather than the rule. It would be useful to libraries in Connecticut to have access to a Union List of Serials (ULS) of as many library serial holdings as possible; this would provide a finding tool for individual serial and journal issues when a patron requires a copy of, or wishes to borrow, a specific journal article. (9.1.3)

MAJOR RECOMMENDATION 5: An ad hoc committee of serial librarians should review existing ULS systems and select one for use in maintaining a statewide ULS. Although this is not an on-line application, the importance of a statewide ULS as a finding tool for serial material is so important to the successful operation of many libraries that it is included in this report.

COST ESTIMATE: $3,000 - $6,000 (for selection)

2.8 FUNDING FOR AUTOMATION

In general there is very little funding available for automation in most Connecticut libraries. Automation costs money to implement. In many cases the major costs are for one-time activities such as the purchase of equipment and the conversion of records to machine readable form; the ongoing operational costs tend to be smaller by comparison and, once the initial activities have been paid for, the ongoing costs can often be shown to be considerably less expensive than the original manual system, especially when growth and inflation are taken into account. By investing in technology, the libraries in Connecticut can receive the additional cost savings and service improvements for many additional years.

Other services, such as rapid and effective interlibrary loan, cannot be achieved at all without the use of new technology. Some procedures, including cataloging a newly arrived title, must be repeated at every library in the state at the high cost of original cataloging if the technology of a bibliographic utility such as OCLC is not used. Without adequate financial resources to pay for vendor services such as conversion and upgrade of records to the MARC format, generation of a COM catalog, etc., there can be no substantial improvement in library services in Connecticut and no possibility of major cost reductions; automation has the potential of achieving both.

> MAJOR RECOMMENDATION 6: The State Library, UCONN, the state colleges, the CLSUs, and public library budgets should include additional dollars for automation over the next 5 years. The state colleges have virtually no budget for automation and must receive additional budget increments to catch up; these increments could help cover the costs of terminals, COM readers, etc. UCONN will require funding for a new circulation control system, the SPIRES on-line catalog for patron and staff use and evaluation, and support to the ULS and other new development activities; UCONN can also provide automation support to other academic and regional libraries. The State Library will need extensive funding to support the automation committees and task forces, the purchase of terminals and readers for the State Library and others, for retrospective conversion and the COM catalog, the vendor costs to upgrade records and generate the COM catalog, a new circulation control system, and the new automation consulting staff. Suggestions for automation projects for state colleges, UCONN, public libraries and CLSUs, and the State Library are described in Chapters 12 - 15.

COST ESTIMATE: Miscellaneous (see individual Chapters 7 - 10 and Part IV of this report)

2.9 AUTOMATION CONSULTANTS

There is not sufficient manpower nor expertise in the state to assist libraries and consortium in planning, selecting, testing, and installing automated systems. To solve this problem of assimilating experience and expertise and sharing it with the next group of libraries planning automated systems, a team of automation consultants is proposed.

MAJOR RECOMMENDATION 7: The State library should hire 1 or 2 new consultant staff with experience in automated library systems, and train some of the current consultants in the various areas of automation, including: circulation systems, data bases, COM catalogs, vendor contracts, RFPs, vendor evaluation, etc. These consultants should be available to work with libraries in performing their automation planning and implementation activities. The cost for the 1 or 2 additional consultants should be added to the State Library permanent budget at the senior consultant level, and additional dollars should be added to the travel budget for the new and the existing staff for visits to conference exhibits and vendor and user sites of specific automated systems. (12.2)

COST ESTIMATE: $30,000 - $40,000 per year.

2.10 AUTOMATION COORDINATING COMMITTEE AND TASK FORCES

In order to define the various automation project tasks and carry them out, an Automation Coordinating Committee (ACC) is described; the ACC's primary responsibility is to oversee all of the statewide automation project work. For each new automation project a project task force is established. (12.1)

MAJOR RECOMMENDATION 8: The ACC charter should be reviewed, revised as necessary, approved, and the ACC be established as soon as possible. The ACC would then be responsible for

initiating the new automation projects according to an ACC-established priority list.

COST ESTIMATE: $4,000 - $8,000 per year (mostly travel)

2.11 THE FIVE YEAR PLAN

Part IV (Chapters 11 - 15) contains a series of recommendations, projects, schedules, suggested responsibilities, and project interdependencies for each of the years 1980/81 to 1982/83 plus some follow-on activities which would occur in 1983/84 and 1984/85. There are too many details to review in this Executive Summary; the reader is is urged to review those portions that deal with their own libraries plus the general recommendations that apply to all libraries. The sections on The Emerging Future of Technology (15.1) and The Library Responsibility (15.2) are repeated here for emphasis.

2.12 THE EMERGING FUTURE OF TECHNOLOGY

New vendors and new automation products will continually appear; existing products and services will change in character, functions, and costs. As new technology appears, vendors will absorb the relevant portions in their new products. As the national library network emerges during the 1980s, libraries will be able to take advantage of the new services, first through utilities, later from network brokers and commercial vendors, and finally through the libraries themselves.

In general, computers and file storage are becoming more powerful and less expensive every year. By 1985 it will be possible for a network broker (such as NELINET) and perhaps a regional consortium to own a computer more powerful than the present computers at the cataloging utilities. The technology and the costs will eventually permit a powerful and relatively inexpensive standalone computer in the library to perform acquisitions, cataloging, circulation, patron and library staff searching, as well as word processing, message switching, electronic conferencing, and special report generation.

Some of this will occur before 1985; these early systems will be marketed and a few pioneering libraries will be using some of these

services by 1985. By 1990 these systems will be the norm rather than the exception.

2.13 THE LIBRARY RESPONSIBILITY

It is possible for Connecticut libraries to take advantage of this technology. The ACC and task forces can bring the information to the attention of administrative boards, trustees, presidents, etc. It is up to the various libraries to justify the expenses of automation in order to achieve the results of better service to the patrons and provide lower unit costs in some areas.

The United States is one of several industrial countries emerging into an information age. Computers and information systems will be a powerful and complex part of our society. During 1985-1990 there will be more powerful information services available in the home than are available today in any library; the use of teletext and home computers will bring personally selected portions of vast information files into the home electronically.

Libraries must be prepared to provide services in this environment or face continually reduced usage. Academic libraries have a responsibility to prepare the students for this environment as part of the academic resources of the institution. This same technology will also change the basic media and possibly the basic form of education; libraries are part of this process.

These products and services cost money; the libraries and their institutions will be facing serious economic decisions. It is to the benefit of the patrons and institutions to have the library staff, administrators, and governing boards knowledgeable and informed about the services, benefits, and costs of available technology.

PART II

CURRENT SYSTEMS AND THE NEED FOR A STATEWIDE DATA BASE

Chapter 3

BACKGROUND

3.1 CURRENT AUTOMATION IN CONNECTICUT LIBRARIES

This section presents a summary of existing automated systems in all types of libraries in Connecticut. On-line and batch cataloging, circulation, and union list of serials systems are described; the amount of library material represented by these systems and the number of records in the system files are summarized. In most cases, the Yale University statistics have not been included in the statewide totals, but have been shown separately where appropriate.

3.1.1 On-Line Cataloging Systems

Nineteen Connecticut libraries utilize the OCLC system (OCLC Inc., Columbus, OH) for cataloging and ILL support. These libraries catalog approximately 180,000 titles per year using this system; one title is cataloged on OCLC every forty seconds throughout the year by Connecticut libraries. Over 1 million computer produced catalog cards are received annually by these libraries. Magnetic tapes with the individual library's bibliographic information are sent by OCLC to NELINET (New England Library Network, including Connecticut) for retention and future processing.

3.1.1.1 Distribution by Type of Library

To date, these libraries have cataloged over 800,000 titles on the OCLC system and NELINET has 460,000 of these records on computer tape, representing the titles cataloged since February 1977. The University of Connecticut and the University of Hartford each account for about 20%

of the total figures (35-40,000 titles per year). (Yale University has cataloged an additional 206,000 titles on OCLC, also at about 40,000 titles per year, and has 102,000 tape records at NELINET.)

Eight public libraries (Ferguson, Greenwich, Hartford, Mary Cheney, Perrot Memorial, Stratford Library Association, West Hartford, and Westport) account for 25% of the titles cataloged (43,000 titles per year), and the State Library, the US Coast Guard Academy, and the remaining academic libraries (Connecticut College, Fairfield University, Trinity College, and Wesleyan University) catalog 35% of the titles.

3.1.1.2 Geographical Distribution

The geographical distribution of the library material cataloged through OCLC (from computer tape records available) shows a high concentration in Region 2 (Capitol Region Library Council) of 48% of all material cataloged through OCLC and Region 4 (Southwestern Connecticut Library Council) at 23% of all OCLC material; these two regions have generated 71% of all OCLC tape records. The remaining four regions show a much lower concentration of automated cataloging with Region 3 (Eastern Connecticut Library Association) at 16%, Region 5 (Southern Connecticut Library Council) at 6%, Region 6 (Southeastern Connecticut Library Association) at 6%, and Region 1 (Region One Cooperating Library Services Unit) at 0%.

Note that these figures do not necessarily reflect the geographical distribution of all library material in Conecticut libraries; the figures do reflect the distribution of available computer tape records from those libraries which obtain automated cataloging service from OCLC.

At the time of this writing, OCLC is supplying all of the automated cataloging to Connecticut libraries; the Yale University library is in the process of converting from OCLC to RLG/RLIN (Research Libraries Group/Research Libraries Information Network - Stanford, CA) for on-line automated cataloging services.

3.1.1.3 Interlibrary Loan (ILL) using OCLC Cataloging Files

Each of the nineteen libraries utilizing OCLC is able to search the entire OCLC data base, consisting of over 5 million bibliographic records representing books, serials, films, etc. Appended to each of these records is a list of "holding symbols" that designate which libraries in OCLC have cataloged that particular item; appended to these 5 million bibliographic records are a total of over 50 million holding symbols. While this indicates a copy of each title is held in an average of 10 different libraries, a large percentage of the cases show that there is a single library (out of 2,000 OCLC libraries in 50 states) holding a particular book. Some popular titles, on the other hand, show hundreds of libraries on the holdings list.

The ability to locate the only known copy of a book from the machine readable portion of 2,000 libraries' collections, and accomplish this in a few seconds, is a very valuable ILL resource, and one which will be heavily used by OCLC libraries in Connecticut and elsewhere. The Connecticut State Library makes use of the OCLC system to locate newer materials at OCLC libraries in Connecticut and out of state.

3.1.1.4 Limitations to Resource Sharing

There are two major limitations to Connecticut resource sharing using the OCLC ILL system. The first limitation is the fact that only those titles cataloged through OCLC by the 19 Connecticut libraries are represented in the data base. Therefore the OCLC data base contains the cataloging of 19 Connecticut libraries (and no other Connecticut libraries) and for these 19 libraries only a portion of their collections is in the data base. In general, the larger and older the library collection the smaller the percentage of titles in the OCLC data base. The University of Connecticut as a large library, for instance, has less than 10% of their titles in OCLC (approximately 100,000 titles); therefore another OCLC library has no knowledge of the other 90% of the University of Connecticut titles (approximately 900,000 titles).

Medium size public libraries tend to catalog fewer than 10,000 titles per year and turn over a large portion of their collections every few years, so the percentage of their collections on OCLC tends to be somewhat higher. In addition, some public libraries are using OCLC to

convert all of their remaining titles so their entire collection is in the OCLC data base. Larger Connecticut public libraries such as Ferguson, Hartford, and Mary Cheney have converted various portions of their collections to the OCLC data base. The percentage of the collection on OCLC for academic libraries falls somewhere in between the public library and the older or larger library picture; none of the State Colleges makes use of the OCLC system.

The second limitation to Connecticut resource sharing is the fact that only libraries that are members of OCLC may obtain terminals and search the OCLC data base. There are therefore only 19 Connecticut libraries and consortia that can search the OCLC data base. In some cases, it is possible to designate a library or consortium as a "processing center" which allows them to catalog, search the files, and perform ILL transactions on behalf of other libraries; the Southwestern Connecticut Library Council (SWLC) is a processing center for any libraries in Region 4 that wish to use SWLC's services. There are also several libraries in Region 4 that are independent individual members of OCLC and obtain services directly from OCLC.

As a result of these two limitations, then, only 19 Connecticut libraries (plus some additional libraries in Region 4) may access the 5 million OCLC titles held by libraries all over the U.S., including 800,000 holdings (copies of books) in Connecticut. The number of unique Connecticut titles (as opposed to duplicate copies of the same title at various Connecticut libraries) in the OCLC files is not known, but a reasonable assumption would expect between 200,000 - 400,000 unique titles to be represented in the OCLC file for Connecticut libraries.

> MAJOR REQUIREMENT: What is needed, then, for improved resource sharing in Connecticut is to provide a larger data base of Connecticut holdings, representing as many libraries, titles, and holdings as possible, that would be available for ILL searching by all libraries in Connecticut.

The particular University of Connecticut example described above (100,000 titles in OCLC and 900,000 titles not in the OCLC data base) was chosen to illustrate an essential point. The entire 1 million record University of Connecticut file exists in computer (machine readable) form on another file available at the University of Connecticut. By utilizing other forms of technology described later in this report this ENTIRE file could be made available to ALL libraries in Connecticut, thus overcoming both of the limitations to resource sharing posed by using the OCLC system for interlibrary loan.

3.1.2 Circulation Systems

3.1.2.1 On-Line Circulation Systems

Nine Connecticut libraries provide on-line circulation services to their patrons. At eight of these libraries a library circulation staff member may check out books for a patron by passing a "light pen" across a special label on the patron's library card and a special label in each of the books. These special labels are bar code labels similar to the striped labels on grocery products. This on-line checkout procedure takes a few seconds per book, resulting in faster service for the patron and eliminates the need to write out any information on slips of paper, make impressions of embossed cards, or photocopy book cards. At the ninth library (UCONN) an 80 column punched card is removed from the book, read by a card reader, and returned to the book pocket.

The automated library circulation records are also more accurate and can be searched by a variety of indexes; other manual records of non-automated systems may only be searched by date due (slips) or date borrowed (photocopy).

Eight of the Connecticut libraries using on-line circulation systems are public libraries; they have all purchased their systems from the same vendor, CLSI (Newtonville, MA). These systems are called "turnkey" systems - the library has purchased the hardware (including the computer, disk files, terminals, etc.), the software, and maintenance (repair) services. The complete systems are installed in the library and are self contained "stand-alone" operations.

Greenwich and Ferguson (Stamford) libraries each have their own systems, Groton and Waterford share a system, the Project LEAP system supports North Haven, Hamden, Cheshire, and West Haven. New London and Norwich libraries are now searching the Groton/Waterford system for ILL purposes, and are not utilizing the circulation portions of the system.

These on-line CLSI circulation systems have the utility to access, search, and perform an ILL from a library on one system to another library's files on a second system. For example, a circulation terminal at Greenwich (normally connected to its own computer and files) can also access the files of North Haven on the Project LEAP computer and request the loan of a North Haven book.

This process is relatively straight forward since all systems came from the same vendor. This picture will change in the near future as more libraries and CLSUs select new circulation systems; it is expected that some of these new systems will be supplied by different vendors. The inter-system ILL request may be more difficult or impossible to perform if the systems are not compatible and the libraries have not required the vendors to provide this interface.

These four installations serving the eight public libraries circulate 2,620,000 books per year (one book every 4 seconds throughout the year). There are 531,000 bibliographic records in these files (Greenwich 122,000, Ferguson 164,000, Groton/Waterford 125,000, and Project LEAP 120,000). In many cases, these records represent the only machine readable records for certain titles in Connecticut. Approximately 40,000 new records are added each year to these files.

The University of Connecticut main campus at Storrs operates a large on-line circulation system for its 1 million volume collection. Each book in the collection contains an 80 column punched card containing the author's last name, a short title, the call number, and copy number of the book. When a book circulates the book card is removed from the book pocket and read by a card reader; this information is stored on a computer file in the computer center. The University of Connecticut system circulates approximately 250,000 books per year. The files are updated on-line.

There is presently a terminal at the circulation desk and one in the public service area used for searching the circulation data base. At present the only on-line search access to the system is by exact call number.

This system is inadequate to meet the current needs of the UCONN patrons. Additional checkout terminals are required on each floor for study room use and additional patron/library staff terminals are needed to search for titles, holdings, etc. In the present system there is no capability to search by author, title or truncated call number, or subject heading. The present system is an absence system; the system can only determine when a given book is not available for circulation (i.e., the book is currently on loan to a patron). The system cannot tell when a book which is owned by the library is available for borrowing. All of the major turnkey circulation systems perform the above functions and can inform the patron or library staff that an item is owned by the library and is on the shelf ready to be borrowed by a patron. The UCONN library should replace its current system with a commercial circulation system.

3.1.2.2 Batch Circulation Systems

The Central Connecticut State College (CCSC) has a batch circulation system using two punched cards with call number, volume, and copy number in each book pocket. To borrow a book the patron removes the cards and punches the patron ID in the cards using a special "Portapunch" board and stylus. The cards are read in a Remote Job Entry (RJE) card reader located at CCSC and transmitted to the University of Connecticut computer at Storrs. The files are maintained at Storrs and updated weekly; a series of printed reports are transmitted to the RJE printer.

3.1.2.3 Current Planning Activities

At the present time several libraries and CLSUs are in various stages of planning and selection of vendors for automated circulation systems. Two CLSUs, Capitol Region Library Council and Southwestern Connecticut Library Council, have selected a circulation vendor (GEAC) and are in the process of finalizing contracts with the vendor. Some additional libraries are in the planning cycle of the selection process.

One of the CLSUs is planning an interesting cost allocation for the circulation system; the CLSU is generating external funding in order to purchase the central system (computer, files, etc.), and requiring the member libraries to fund only their own terminals, shared line costs, and shared costs of ongoing operational expenses.

3.1.3 Acquisitions, Serials, and Bibliographic Search Services

3.1.3.1 Acquisitions Systems

At the present time, two major book jobbers (Baker and Taylor, and Brodart) offer on-line book ordering as part of their acquisitions services. In addition, these jobbers and several others (Blackwell North American, etc.) offer acquisition tapes with the book orders; these tapes contain full bibliographic data for each title ordered by a library. The tapes are in the MARC tape format and vary in cost from $0.15 per record to free, depending upon the book contract and other factors.

Currently no Connecticut libraries are utilizing on-line book ordering systems. No Connecticut libraries are ordering acquisition tapes from the book jobbers.

OCLC is in the process of developing an acquisitions system which will be in field testing during 1980. When this system becomes generally available some of the OCLC libraries in Connecticut will likely begin using the system.

For more information about acquisition and book ordering systems, see Chapter 8.

3.1.3.2 Serials Systems

There are several batch Union List of Serials (ULS) systems in use in Connecticut libraries. The University of Connecticut has sent its data to the University of Massachusetts (UMASS) for inclusion in the UMASS ULS data base. The 19,000 University of Connecticut serial titles appear on a microfiche ULS available at several locations throughout the University of Connecticut campus.

The State Library operates a Union List of Serials for 200 Connecticut libraries. With 74,000 holdings for 33,000 titles this ULS system is the largest system in the state.

Southern Connecticut State College (SCSC) has a machine readable serials holdings file of 2,000 serial titles; the file is published in printed form. Central Connecticut State College (CCSC) also has a machine readable periodical holdings file published in printed form.

Many special libraries have printed union lists of serials including 2,200 serial titles at United Technology, 800 titles at the Connecticut Agriculture Experimental Station and the 6000 serial titles at the Yale Medical library. There are many more union list of serials files and published copies showing the serial holdings of special libraries in Connecticut than have been described here.

3.1.3.3 Bibliographic Search Services

In general only the larger special libraries with the budget and the clientele perform bibliographic searches using the commercial search services such as Lockheed, SDC, BRS, and the New York Times for a wide variety of information, the federal services such as NLM's MEDLINE for medical information, and LEXIS and JURIS for legal information. These systems supply information printed at the user's terminal or on the vendor's computer printers rather than in machine readable form. The derived information about journal articles shows the journal name, issue, page numbers, author, title, abstract, and keywords for specific articles.

If the library does not own the journal issue in question, the library must locate a copy of the requested article. The bibliographic data base used for the search does not contain any library holdings; for this information the union list of serials, described in the previous section, must be utilized.

3.1.3.4 Other Machine Readable Files

There are a few additional machine readable files that exist in some libraries in the state and on library vendor files. The State Library has a file of over 100,000 bibliographic records from 1968 to 1974.

Certain book jobbers maintain machine readable book order information for libraries that have ordered material or accepted approval plan material. This jobber information could be converted into useful bibliographic data for customer libraries.

3.2 SHARED RESOURCES: ACCESS TO BIBLIOGRAPHIC DATA

3.2.1 Location of Material

When a library does not have the material required by its patron the library will attempt to locate and borrow the material from another library. The difficult element in an interlibrary loan activity is the location of the material; tools for locating materials in other

libraries are limited by the number of libraries and proportion of their respective collections represented in the particular finding tool. Without an adequate finding tool the library has no rapid, cost effective, or convenient way of determining which of the other libraries have the requested material; at best, this determination is an intuitive, somewhat random, costly, and time consuming venture.

Although most of a library's circulation utilizes relatively current materials, much of InterLibrary Loan (ILL) requires knowledge of the loction of non-current materials. This component of ILL (the location of older, little-requested material) adds significant costs and time to current ILL operations, often resulting in the patron not receiving the material in a timely manner, if at all.

3.2.1.1 Assumed Locations

Because full knowledge of the holdings of all libraries is not available, the traditional assumption in ILL has been that all materials not located in the local library are assumed to be available only at larger libraries. This has led to a disproportionate burden of ILL requests on the largest libraries, with the resultant imposition of ILL charges by these libraries. In fact, experiments in Illinois and elsewhere have shown that the amount of comparatively unique material in smaller libraries is much greater than originally assumed and that this material is more often available in a timely manner than is the same title located in a larger library. However, without knowledge of the location information, a system of regional cooperation will not be more effective than such ILL tools as the National Union Catalog and OCLC files.

3.2.1.2 Effective Location Tools

ILL is fastest and least expensive when done library-to-library rather than through intermediary centers. This, again, requires knowledge of location information through a statewide data base.

Knowledge of the location of materials within the state also aids libraries in making informed acquisition, retention, and discard decisions of little-used materials. This should reduce the need for

costly storage facilities for lesser-used materials while ensuring their availability. In order to make the most effective use of this new information it is necessary for libraries to formulate collection development policies on a cooperative basis.

3.3 THE CONNECTICUT STATEWIDE DATA BASE

The location tools available today are fragmented and incomplete. What is needed, therefore, is a tool that contains as much information about Connecticut library materials as possible, is relatively inexpensive, and is available to as many libraries as possible.

The most cost effective and timely manner of producing a statewide location tool is to generate a single comprehensive statewide machine readable data base from existing machine readable records. Once the initial version of the statewide data base has been developed many products can be derived from this data base including: a statewide finding tool, local and regional finding tools, circulation files for local and regional circulation systems, patron access files for local, regional, and statewide on-line catalogs, etc.

The creation of the initial data base from existing sources (OCLC records, UCONN circulation cards, CLSI records, etc.) is described in detail in Chapter 5, Data Base. The growth beyond the initial version and maintenance of the data base is also described in Chapter 5.

3.4 AVAILABILITY OF CONNECTICUT MACHINE READABLE RECORDS

The following existing machine readable files represent holdings of Connecticut libraries. The file size, record format, and conversion (upgrade) requirements to a full bibliographic record are described.

1. OCLC tapes. These 460,000 records are full bibliographic records (in the MARC format) including the library's local call number, copy information, and location data. The data from these records need to be merged to eliminate duplicate titles, while retaining the local call number and copy information from each library. (There are an additional 340,000 records in the OCLC archival file which have not yet been processed and transmitted to NELINET on magnetic tapes.)

2. UCONN Circulation Punched Cards. These 1 million records are in the form of 80 column punched cards containing brief author and title, and full call number, volume and copy information; each card represents one copy of one book. The card images would have to be converted to tape, duplicate titles merged, and the records upgraded to MARC by a commercial vendor (see Chapter 5, Data Base).

3. CLSI Circulation Records. These 531,000 records are brief circulation records that reside on the CLSI disks and contain brief author and title data, and full call number, copy, and location data and in some cases publisher, LC card number, and other miscellaneous data. The files from the four different CLSI computers must be copied to tape, merged to eliminate duplicate titles, and upgraded to full bibliographic records by a commercial vendor.

4. State Library OCR Records. The 100,000 tape records are relatively full bibliographic records. These records could be upgraded to full records.

As a final step, the vendor will be required to merge the OCLC, UCONN, CLSI, and State Library records to eliminate duplicate titles, while retaining all local call number, copy, and location data. The initial version of the statewide data base would now be complete.

3.5 COOPERATION

In order to make effective use of resource sharing and to reduce costs of shared projects such as the development of a union catalog finding tool, ILL, shared regional circulation systems, and retrospective conversion, there must be cooperation among all types of libraries. This inter-type library cooperation will not be easy due to governance and clientele constraints; special libraries may not be able to serve outside patrons, private academic institutions may not be able to serve non-academic patrons, etc. These are difficult, but not impossible, barriers to overcome.

There are a few points about cooperation which should be kept in mind.

1. Different types of libraries are more likely to cooperate where there is an ECONOMIC or SERVICE ADVANTAGE to their participation.

2. If there is an economic advantage, cooperation is easier to achieve. On the other hand, if there is not an economic advantage, the service advantage must be overwhelming (not merely "nice").

3. With cooperation, there is a form of synergy involved; each participant can receive much more than it gives - for example, a cooperative project for retrospective conversion.

4. With cooperation, some achievements are possible that are not possible alone - for example, production of a COM union catalog or an on-line union catalog.

3.6 STANDARDS

In order to take maximum advantage of technology, commercial services, and the emerging national network, it will be necessary to adhere to national standards. Although the form and procedures are not defined in detail it is certain that the records will conform to:

1. standard record formats - MARC II Communications Format.

2. cataloging standards - AACR2

3. authority control

In order to be ready, Connecticut libraries will have to establish practices which are accepted as national standards. This will insure that Connecticut records can be used by other libraries, and Connecticut libraries can in turn use records created by other libraries including the Library of Congress (LC).

1. The cost of creating non-standard records will become more and more expensive, while failing to provide comparable increased utility to users.

2. The establishment of, and agreement upon, standards may prove to be one of the most difficult aspects of state-wide automation.

3. The Automation Coordinating Committee (ACC) (see Section 12.1) should be responsible for establishing standards for statewide bibliographic control, resource sharing, the data base, and COM catalogs. The ACC should participate in the definition, approval, and eventual implementation of the statewide standards.

Chapter 4

ON-LINE CATALOGS

The ultimate finding tool for Connecticut library materials is an on-line catalog, which would permit Connecticut library staff and patrons to use computer terminals in their local library to determine the existance, and location, of desired materials. On-line catalogs are not available at the present time, nor are they likely to be in widespread use over the next 5 years. While other activities such as the statewide data base and COM catalog and circulation systems have a higher priority (see Part IV), it is important to include on-line catalogs in the long-range plans for library automation in Connecticut.

This chapter provides a variety of planning information for on-line catalogs. An on-line catalog would contain full bibliographic records which could be used as a source of cataloging for the library staff or for bibliographic verification for the library patron. Associated (or linked) with each bibliographic record which represents a book, film, phonograph record, etc., would be an indication of each library that owns the material, the local call number, volume, copy, and location. An on-line catalog would eliminate the need for other forms of a catalog, including catalog cards, book, COM catalogs, etc.

Each library would be able to search the on-line catalog file by any of a variety of access points including any of the authors, individual words in the title, subject headings, call number, LC card number, ISBN, and any other useful access points. For records selected as valid, the user should be able to review full or partial bibliographic information, a list of libraries owning the book (based on a pre-selected list of regional, in-state, or special association libraries), and the local library information about the particular item. This scenario of an on-line catalog should be valid for a statewide, regional, or local library on-line catalog. With a local library on-line catalog, only the holdings of the local library would be included in the data base, and therefore only local holdings information would be available for display to the library staff or patron.

4.1 GENERAL REQUIREMENTS OF AN ON-LINE CATALOG

In order for an on-line catalog to replace the current card, book, or COM catalog, several conditions must be met.

1. The quality of bibliogrpahic data of the on-line catalog must be equal to or better than the original catalog.

2. The number of access points in the on-line catalog must be equal to, and preferably greater than, the original catalog, including as a minimum the title, any author, and subject heading. Added access points could include title keywords, call number (with truncation), series, LC Card Number, ISBN, and publication date.

3. The form of access to the bibliographic records should utilize some form of interactive searching providing the user with intermediate search results at each step in the search; this allows the user to react to the search results and influence the next step in the search.

4. The system should provide more than one level of user interface to accommodate the various levels of user sophistication and expertise. For instance, a menu system might be quite adequate for a novice or naive user, yet could prove to be quite inefficient and time consuming for an experienced searcher. A structured formal search language with Boolean operations would provide an efficient interface for an experienced user, and would obtain the required search results in a minimum of user time; this same search language would likely prove much too complex for a naive user.

5. The system should provide some on-line training tools to assist the user in learning how to become an experienced searcher. An on-line training manual with some Computer Aided Instruction (CAI) features would provide much of this capability.

6. The system must be capable of handling the expected searching load within an acceptable response time range (i.e., 5 seconds average to 10 seconds peak load for search languages, or 2 seconds average to 5 seconds peak for a menu system). Interactive searching makes a heavy demand on the computer and disk files; it is vital for the system to be able to handle the average and peak searching load.

7. The system must have a "fail-soft" or backup capability. Since the on-line catalog is the replacement for the current catalog, the unavailability of the system due to a hardware or software malfunction has the effect of denying all searchers access to the catalog. This situation is to be avoided or at least minimized to acceptable levels. This could mean the installation of redundant hardware (extra computer, one extra disk drive, etc.); another approach is the provision of a backup catalog such as a COM catalog and a small number of COM readers at each location where there are on-line terminals.

8. The system must provide for rapid and efficient maintenance of the data base. Since libraries add from a few to several hundred new titles and hundreds to thousands of new volumes to their individual collections each day, the system must update the files to reflect this new status. The files should be updated on a daily or other periodic cycle. An on-line or batch automated interface with a cataloging system to provide bibliographic records to the on-line catalog file is highly desirable and would reduce the manual effort to keep each of these systems current. A similar interface to a cataloging system or a circulation system to capture the local copy information is also desirable.

9. The on-line catalog must accurately reflect the library's holdings. This simple statement implies that the on-line catalog will reflect new items added to the collection, items removed from the collection, and items moved to other parts of the collection.

10. The on-line catalog must reflect the local and national authority files and cross references for personal and corporate names, subject headings, series, and uniform titles, etc. The system should accept the patron's popular terms, then, with the patron's knowledge, find the appropriate local or national authority term and select the appropriate records for the patron.

4.2 POTENTIAL SOURCES FOR ON-LINE CATALOG SYSTEMS

4.2.1 OCLC On-Line Catalog

The OCLC system, as described in Section 3.1.1.4, has several major limitations as an on-line catalog: 1) only OCLC users may access the system (currently limited to 19 Connecticut libraries), 2) only the records cataloged by these libraries are shown as Connecticut holdings in the data base (approximately 1-10% of the total holdings of these 19 libraries), 3) there is no local call number, copy or location information on the OCLC on-line file, and 4) the searching is limited to a few of the necessary access points and does not provide searching by every author, subject headings, local call number, etc.

For these reasons, the current OCLC system cannot be used as a statewide, regional, or local library on-line catalog; it can and is used as an effective union catalog finding tool for the recent holdings of the 19 Connecticut member libraries (as well as the 2,000 out-of-state libraries).

OCLC is in the process of selecting a circulation vendor for regional installation of circulation systems. If the vendor and system selected by OCLC provides the capability to maintain local holdings data (which it most likely will be able to do), and provides access by subject headings, local call number, etc., the distributed "circulation" system could be considered a candidate for a local, regional and, possibly, (with proper computer-to-computer linking) a statewide on-line catalog.

4.2.2 Development of a Connecticut Statewide On-Line Catalog

The development of a local, regional, or statewide on-line catalog is an enormous undertaking. Expertise is required in computers, variable length fields and records, complex file structures, Data Base Management Systems, teleprocessing, timesharing, complex user interfaces, variable output formats, system performance measurements and optimization, and fail-soft design and operations. It is not likely that an in-house data processing center has sufficient experience in enough of these areas to attempt to develop a system capable of performing tens of millions of searches per year (1-5 searches per second, all year long).

The next section describes some design plans from certain commercial vendors to develop an on-line catalog. The sale price of a commercial system is likely to be 10-50% of the cost of an in-house development,

and should be considered as a serious alternative to in-house development.

4.2.3 Commercial Turnkey On-Line Catalogs

4.2.3.1 Cataloging Vendors

The cataloging services currently provide somewhat limited forms of on-line catalog support for patron searching; in some cases the limitation is in the indexing and searching function (i.e., lack of local data and subject searching in OCLC, lack of authority files in RLG/RLIN, etc.) In all cases there is a real limitation on the CAPACITY of the system to handle the large number of patron searches.

The number of terminals required for cataloging in most libraries varies from 1 to approximately 15 depending on the number of new titles added per year. The number of terminals required for patron searches on the other hand is a function of the number of patrons simultaneously searching the catalog, the number of possible locations to search the catalog (branches, dormitories, offices, etc.), and the complexity of the patrons' search requests; estimates of 5 to 50 patron terminals are not uncommon, with some estimates of over 200-500 patron terminals for large multibranch libraries.

The computer and disk resources required to perform searching is much higher than the resources necessary to support cataloging; this fact coupled with the fact that there will be many more patron terminals compared to cataloging terminals will saturate any computer trying to offer this service on a nationwide basis. All of the cataloging utilities have realized this capacity limitation and are planning to offer some form of distributed on-line catalog service, where a series of regional computers and files will support a relatively small number of libraries. The network brokers (NELINET, SOLINET, etc.) are also considering offering this type of patron access service. The likely timeframe for this service to become generally available is 1982-1985.

4.2.3.2 Circulation Vendors

Most of the circulation vendors also offer some limited form of on-line catalog. Circulation systems have the local item data (call number, copy, and location information) as an integral part of the circulation data base; what is lacking in many circulation systems is a full bibliographic record. This results in a limitation on searching capability; without a subject heading stored in the record, there can be no subject heading index and therefore no subject searching.

Like the cataloging systems, the circulation systems suffer from a serious capacity limitation when trying to perform patron searching while also handling circulation transactions.

Some circulation systems have brief bibliographic records, others have almost full records. Some systems use a structured search command and some a menu system. None of the systems currently supports both of these types of searching, a full bibliographic record, AND Boolean searching.

Several of the circulation vendors are planning this level of on-line catalog support; some vendors will develop the on-line catalog as a separate system, others as a combination circulation/on-line catalog system. The likely timeframe for this service to become generally available is 1982-1985.

4.2.3.3 DBMS Vendors

The developers of Data Base Management Systems (DBMS) are becoming interested in the on-line catalog market. Some of these vendors have software that can handle a MARC record format, build multiple indexes, and perform complex searches, some with Boolean operations. The DBMS vendors do not provide menu searches.

The DBMS vendors could build an integrated package including optimum selection of computers, disks, and patron terminals, as well as optimum design of search languages and user interfaces. The DBMS vendors have fewer design constraints than the cataloging or circulation vendors. The timeframe for this development is unknown, but not likely to be generally available prior to 1982.

4.3 SCENARIOS FOR ON-LINE CATALOG IMPLEMENTATION

The preceding sections described the status of on-line catalogs and the availability from cataloging, circulation, and DBMS vendors. The statewide online catalog system may come from one of several sources.

1. The system may be developed and operated by a cataloging vendor such as OCLC or RLG/RLIN. In this case, the on-line catalog would be a regional union catalog of a portion of a state, an entire state, or a multi-state region.

2. The system may be developed by a catalog vendor (i.e., WLN - the Washington Library Network) or a DBMS vendor and purchased and operated by a network broker (i.e., NELINET). The catalog would likely be for a multi-state region.

3. The system may be developed by a catalog, circulation, or DBMS vendor and purchased and operated by a statewide or regional consortium (i.e., the State or a CLSU); the catalog would therefore be a statewide or regional catalog.

4. The system could be developed by a catalog, circulation, or DBMS vendor and purchased and operated by a local library; the catalog would be a local catalog.

The first two options are likely to be used for union catalog purposes, as a finding tool for interlibrary loan, and a collection development and retention tool; it would most likely not be used for patron access (except on a very limited local basis) due to the heavy terminal, communication lines, computer, and disk capacity limitations of the system.

The final option, a local library on-line catalog, could be used as an on-line catalog for patron access, and permit the elimination of the card or book catalog.

The statewide option probably falls in the union catalog category, and would not provide sufficient capacity to allow local libraries to eliminate their present catalog.

The regional option falls somewhere between the local on-line catalog and the statewide union catalog capabilities. If the number of patron terminals were not excessive, perhaps less than 200 (the possible capacity of a medium-sized system), the regional system might be able to

handle the on-line patron searching for a group of libraries. If the patron terminal requirements were higher than the capacity of the system, the regional system would have to purchase additional systems (computers, files, etc.) or provide a regional union catalog service without patron access.

4.3.1 System Capacity - A Note of Caution

A note of caution is in order here. When evaluating on-line catalog systems do not be misled by the capacity of the system measured in number of terminals. The statement "The system can support up to 255 terminals" (or 64, or any other number) may be referring to the maximum number of terminals that can physically be connected to the hardware, or that can logically be handled by the software. In most cases, this is not representative of the true capacity of the system.

In most on-line search systems the computer resources required to process the "255" simultaneous search requests, and the disk requirements to support these search requests are the actual system bottlenecks. A system capacity of 255 terminals may become saturated when 40 users are searching simultaneously; the actual capacity is, therefore, less than 40 terminals. The capacity of the system is determined by the design of the software and user interface, the file and record design, the speed of the computer and size of the memory, the disk access speed and the number of disk accesses to obtain the desired record, the efficiency of the operating system, timesharing monitor and terminal and disk input/output software, and a variety of additional considerations. It is not possible to evaluate all of these factors to determine the system capacity; the most effective way of determining the system capacity is to load a real bibliographic and holdings file of the same size as the final system into an on-line catalog system, attach a specific number of terminals ("n"), then have trained and untrained searchers perform simultaneous searches (by author, title, subject headings, etc.) as fast as possible and measure the response time.

If the resulting response time is less than the acceptable threshold (less than 5 seconds, 10 seconds) the system capacity is at least "n" terminals under peak load conditions. If the response time is above the accepted threshold, the system cannot handle a peak load of "n" terminals. This benchmark or acceptance test should be run live, not as a computer simulation; the terminals, lines, searchers, and search requests must be real.

4.4 SCHEDULES FOR ON-LINE CATALOGS

It is difficult to predict when various forms of on-line catalogs will become available, and, further, when they will be in wide-spread use. The circulation vendors may produce an on-line catalog for local or smaller regional use in the 1981-1982 timeframe. The cataloging vendors may provide regional distributed online catalogs in the 1982-1983 timeframe.

An exception to this schedule is the Washington Library Network (WLN) software which is available now for $300,000, and requires a relatively large IBM (or IBM-compatible) computer to support extensive patron searching. The cost of the hardware and operations makes the unit cost per patron terminal very expensive if the system is used exclusively for patron searching. The WLN system also provides acquisitions, cataloging, authority files, etc., and is more likely to be selected for these features; the capacity remaining for patron searches would be, therefore, diminished.

DBMS vendors may provide systems for single libraries in the 1982-1983 timeframe, and multi-library catalogs at the same time or somewhat later.

4.4.1 Conclusion

Standalone on-line catalogs are not available now and will not be available for several years. The best policy to persue at this time is to plan for the eventual use of an on-line catalog and make effective use of interim products. The development of on-line catalog systems may well take longer than expected; it is unlikely they will take much less time. Most of the systems will take a few years after the products are first available to come into normal everyday widespread use. The process of planning, organizing, generation of funding, and actual installation, training, and availability for patron use will take several years (2-5 years depending on the number of libraries to organize, generate funding, etc.).

Two very valuable implementation activities should take place during this period;

1. generation of a statewide data base for the on-line catalog,and

2. generation of an interim COM (Computer Output Microfilm) catalog from the statewide data base.

The next two sections describe these activities in general terms, and Chapter 5 provides the details.

4.5 THE NEED FOR A DATA BASE

The two primary ingredients of an on-line catalog are the system (the hardware and software described in the preceding sections) and the data base. The data base for a local library contains the bibliographic and local holdings information for the single library; a regional data base contains data for all libraries in the region, and a statewide data base contains data for all libraries in the state.

The process of developing a local, regional, or statewide data base is a complex, expensive, and time consuming activity.

Once the data base has been developed, it can be used for a wide variety of purposes; some of the multiple uses of the data base include the generation of a COM catalog, generation of a file to be used for the on-line catalog for a single library, a region, or the state, a resource file to aid other libraries in performing their retrospective conversion, and the generation of a file to be used for a single library or a regional circulation system.

The investment in the development of a data base may be considered very expensive if it were used for only one of these purposes; as a foundation for all of these uses, it is a bargain.

4.6 THE COM CATALOG: AN INTERIM FINDING TOOL

The statewide COM catalog can be generated directly from the statewide data base and used as an interim finding tool to be used until the availability of the on-line catalog. The COM union catalog will provide a valuable and inexpensive finding tool for material in

Connecticut libraries. The initial records in the early statewide data base will provide a more effective tool for locating library materials than any other tool, including the manual Connecticut Union Catalog of 225,000 records. The widespread availability of the COM catalog which can be reproduced for $200 - $400 per copy plus the one-time purchase of a COM reader brings the cost within the reach of a large number of Connecticut libraries.

This widespread availability of a statewide COM union catalog during the development of the statewide data base (and prior to the availability of an on-line catalog) permits the early partial payoff of the costs of generating the statewide data base.

4.6.1 Forms of COM Catalogs

A COM catalog can be produced on roll microfilm or microfiche, or both. One roll of microfilm can contain up to 175,000 records, thus requiring multiple rolls and multiple readers for a full statewide catalog. These readers cost approximately $800 - $1000 each. Microfiche readers are considerably cheaper, approximately $150 - $200 each, and only one reader is needed no matter how large the catalog. Because each fiche contains up to 1250 records, many pieces of fiche are required for a statewide catalog.

4.6.2 Choices of Forms and Cumulation Levels

Because of the problems and associated costs of re-filing and the mis-filing pieces of microfiche, roll film is preferred for general public use, particularly in situations where a microform catalog is the only catalog for a library. With a machine readable data base it is possible to keep each library's files separable and to merge the catalog at any level. Thus, a catalog of all Connecticut public libraries or a catalog of all libraries within a region could be produced. Each mix of formats can be created at nominal cost, so the form of the catalog could be determined based on area of use, size of the file, and local library variables. Thus, one library could have a microfilm catalog of its own holdings, a regional microfilm catalog, and a microfiche catalog of the statewide data base.

4.6.3 Backup to the On-line Catalog

Another major feature of the COM catalog is that it can serve as a backup to the future on-line catalog in those periods when the on-line catalog is unavailable due to hardware or software difficulties.

4.7 AN INTERIM ON-LINE CATALOG FOR UCONN

The UCONN library is in a very advantageous position to be able to offer a useful library service. In addition to the one million book cards which can be converted to full bibliographic records, the UCONN computing center has recently acquired and installed the SPIRES software on one of its large computers. This SPIRES software is designed to handle bibliographic files on-line and provide a wide variety of searching and retrieval capabilities, thereby performing many of the services of an on-line catalog. The ultimate ability to search by any author of a book (even with different forms of the author's name), any word in the title, any word in a company or agency name, partial or full subject headings or call numbers, and a variety of numerical codes are a basic part of the SPIRES system. This on-line searching by patrons and staff would be a supplement to, rather than a replacement for, the card catalog at UCONN, due to limited capacity and back-up.

This system would provide an extremely useful patron tool, providing the ability to search for materials more effectively than with a card catalog. Because terminals can be placed anywhere on the UCONN campus, and perhaps on campuses of the State Colleges, the effectiveness and range of the UCONN card catalog is dramatically increased. The development costs should be relatively inexpensive. The operational costs consist primarily of the one-time generation of the magnetic tape from the book cards, and file-building and file storage, plus the file searching costs generated by the patron searches. Assuming that the existing UCONN computer can handle the additional searching and file-building requirements, the only incremental cost to UCONN would be the additional disk storage, terminals, and transmission lines.

UCONN can generate the SPIRES file from the book card images converted to tape; this would produce a short bibliographic record with one author, a short title, call number, and copy information. This limited searching service could be available in approximately a one year time frame.

The SPIRES file can also be generated at a later time from the retrospective conversion tape produced by the COM catalog vendor. This would provide a complete bibliographic record including UCONN holdings, and would take closer to two or three years, due to the time delay in establishing the statewide data base project, selection of a vendor, and finally upgrade of the bibliographic records, and would be considerably more expensive than the initial version. It may be possible to implement the first version of an on-line catalog using the book card records and a later version using the full bibliographic records. Since UCONN is an OCLC library, the UCONN OCLC tapes can also be used to update the full bibliographic version SPIRES file.

It is difficult to determine the cost benefits of either version due to the lack of information on the future rates that would be charged by the UCONN computing center and the future computing resources needed for file-building and patron searching. It will be necessary for the UCONN library to make such a cost/benefit analysis for each version of the system. This cost/benefit analysis should also consider the future plans for vendor-produced systems.

Chapter 5

DATA BASE

The creation of a machine-readable data base is the most important, time-consuming, and expensive step in automating libraries. This data base must contain records in a universally accepted standard, which, for the United States today, is the MARC II Standard Communications Format. (This format consists of specific required information, called fields, with specific identifiers, called tags, arranged in a specific manner on a specified form on magnetic tape. The MARC II format should not be confused with records from the Library of Congress MARC data base which consists of records of materials cataloged by the Library of Congress and stored in the MARC II format. A record may be cataloged by anyone to MARC II standards. The term "MARC data base" generally refers to the 1,000,000 plus records cataloged by the Library of Congress in MARC II format.)

5.1 AVAILABLE MACHINE READABLE RECORDS

Although no cohesive plan for a Connecticut bibliographic data base currently exists, there are, nevertheless, numerous machine readable bibliograhic records available in Connecticut libraries. These vary in complexity from brief entries to full bibliographic records in MARC II national format standards. Fortunately, even the briefest of these entries can be upgraded to national standards utilizing special computer programs and files. These national standard machine readable records should be used to form the basis of a statewide data base and union catalog. These records should come from four sources:

1. All currently available machine readable records no matter how brief or the purpose of the original conversion. These include, but are not limited to, OCLC cataloging records, UCONN circulation punched cards, CLSI and other circulation records, and Connecticut State Library tapes containing records from 1968 to 1974, originally keyed on OCR (Optical Character Recognition) forms.

2. Records which will be converted in the future for any other local purpose such as circulation or cataloging. Records belong in this category if the local decision for conversion is based on the cost-effectiveness of the original application. In most cases it will be advantageous to convert the records for the statewide data base first and then use the data base records to create records for the cost-effective local application.

3. Retrospective conversion of holdings in specific libraries, or collections, or by date. A priority list should be created by the Automation Coordinating Committee (see Section 12.1) of those sources holding unique materials, heavily used for ILL, etc. It may be necessary to provide outside funding to convert records of statewide need if the local jurisdiction is unable to fund conversion itself. The creation of this priority list will probably require statistically valid studies of the overlap in library holdings.

4. Future or on-going records from OCLC tapes and acquisition tapes as well as direct input.

Although, as described earlier, a statewide on-line catalog is not feasible at the present time, the machine-readable data base created for an interim method is fully usable as an on-line file once an on-line catalog becomes feasible. In addition, due to anticipated computer malfunctions, a backup method will continue to be required in the future.

5.2 COM CATALOG

The most feasible current solution to providing holdings information statewide is a Computer-Output-Microform (COM) catalog. This catalog may be produced in either microfiche or microfilm or both. In addition to serving as a current substitute for, and a future backup for, an on-line catalog, COM is more versatile in that inexpensive readers and self-contained operation mean that COM can be used in more areas than on-line terminals, such as smaller school libraries and non-library settings such as dormitories, factories, and shopping centers.

5.3 BUILDING THE DATA BASE

Over 2.5 million existing machine-readable bibliographic records, representing an unknown number of titles, have been identified within the State of Connecticut.

5.3.1 University of Connecticut Circulation Punched Cards

Each of the approximately 1,000,000 volumes at the University of Connecticut (Storrs) library holds an 80 column punched card containing the call number, main entry, title, location, and copy information in a non-fixed-field format. Because of the 80 column limitation, the main entry and title information may be truncated. The UCONN circulation system is an absence system, listing only those materials which are currently charged out. No tape has ever been made of the 1 million cards. It is possible, however, to remove the card from each volume, read the card into a data entry reader (or, if that is not possible, duplicate the card immediately), and return the original card to the book. The information from the cards, plus the in-circulation file, would be converted to a magnetic tape to create a short record file for UCONN. Although this is a very labor-intensive operation, it is a one-time occurrence and, combined with the steps outlined in the section on upgrading existing records, is considerably less expensive than any other means of massive retrospective conversion. In addition, it has the advantage of creating records only for those materials which can still be located in the library.

5.3.2 OCLC Catalog Records

Currently nineteen libraries in Connecticut are using OCLC (via NELINET) for cataloging records and catalog cards. Machine readable records of materials cataloged since January 1977 are available at NELINET which has been ordering magnetic tapes for all of its libraries. These records are in MARC II format and contain OCLC identification numbers for easy detection of duplicate titles. There are 561,760 records of materials cataloged since January 1977, of which 108,220 are for public libraries, 91,776 for the University of Connecticut (an overlap with the UCONN circulation file), 30,551 for the State Library,

227,324 for private academic institutions other than Yale, 2,160 for special libraries, and 101,729 for Yale. It will be necessary to extract the participating Connecticut libraries' records from the NELINET file before these records can be used for a statewide data base.

In addition to the post-January 1977 records, there are an additional 431,572 records in the OCLC data base. These archival records are not currently available on magnetic tape, and it is unknown when OCLC will complete the archival run necessary to produce these tapes. The archival files contain 104,293 records for public libraries, 77,562 for the University of Connecticut (again, an overlap with the UCONN circulation files), 31,146 for the State Library, 114,152 for private academic institutions other than Yale, none for special libraries, and 104,419 for Yale.

5.3.3 CLSI Circulation Files

There are currently four automated circulation control systems operating in public libraries in Connecticut. All four are manufactured by the same vendor, CL Systems, Inc. (CLSI). Each of these four systems has a machine readable file of all or most of the titles in the owning libraries. The LEAP libraries have 120,000 titles, Greenwich 122,000 titles, Ferguson Library in Stamford 164,387 titles, and Groton-Waterford over 125,000 so far. These files, however, are very brief and not suitable for data base use in their present form, especially as the records contain no subject or added entry information. In addition, the degree of overlap of these files with each other and with the OCLC tapes is unknown.

5.3.4 Connecticut State Library Machine Readable Records

The Connecticut State Library has a machine readable tape containing 67,944 records for materials cataloged from 1968 to June 1974. They contain a MARC-like catalog record with fields and tags similar to the MARC format. Each record contains a Library of Congress Card Number (LCCN) or a locally-created LC-like number. Monographs, audio-visual materials, maps, and serials are in the same format. The number of unique titles (non-overlapped with OCLC, UCONN, or CLSI) is unknown, and monographs would have to be stripped from the file for use in a statewide data base.

5.3.5 Upgrading of Existing Records to MARC Format

In order to merge records of different institutions, to insure that future records will be compatible with old records, and to minimize costs by using existing vendors and software, it is necessary to convert all existing non-MARC-format records into MARC format. Using a computer and existing programs to do this is dramatically less expensive than converting the manual records to machine-readable form again. The conversion of the University of Connecticut circulation file is discussed in Section 5.3.5.2. The CLSI disk files can be converted to magnetic tape and matched against a file containing the entire Library of Congress MARC cataloging file as well as the MARC format machine readable files of large public libraries (using large public library files because all of the CLSI systems are in public libraries and this file will result in a higher percentage of matches).

5.3.5.1 Upgrade Costs

One major COM vendor will do this upgrade step for $0.04 - $0.05 per record, with the cost dependent upon the total number of records processed. (All COM costs are approximate and are based on one vendor's standard prices in September 1979.) At this point there is a separate charge for each duplicate record since, at this stage, duplicates are not yet identified. The match is best accomplished by matching Library of Congress Card Numbers (LCCN) of the non-MARC records against the LCCNs of the source file. An additional match of the main entry and title data is made at this time for verification purposes. Matches which are ambiguous or duplicates are identified and require library staff intervention for resolution. The original main entry and title can be displayed on the COM output until a match is identified at a later step or until a full upgrade is entered manually into the data base. A similar procedure for the State Library machine readable tape would also cost $0.05 per record plus a small charge for special programming necessary to handle the unique Connecticut State Library format. The OCLC current and archival tapes would also be subject to a $0.04 - $0.05 processing charge.

Once all of the current non-MARC machine readable records are converted to MARC format, the files can be consolidated at an approximate cost of $0.02 per final unique title. This consolidates and merges location information for the same bibliographic record.

5.3.5.2 UCONN Conversion

The UCONN library should obtain a machine readable tape copy of the one million book cards and, with State Library support, submit this tape to a conversion vendor (the Statewide data base vendor). The vendor would upgrade the records to full bibliographic form, eliminate the duplicate titles while merging the holdings, and add these records to the statewide data base. It would then be possible to produce a COM catalog extracted from the statewide data base for use by UCONN, other academic libraries, the State Library, or any other library with a requirement to have a copy of the UCONN catalog.

5.3.5.3 Pricing Sample for the UCONN Conversion

The cost is likely to be $0.04 to $0.05 per record for conversion to full MARC records ($40-$50,000 one-time for conversion), plus $0.02 per unique title for merging and tape generation ($20,000 for 1 million unique titles, or $10,000 for 1/2 million titles); these one-time conversion costs ($50,000 - $70,000) would be part of the statewide data base project. Production of a UCONN COM catalog would cost an additional $0.03 per unique title to make the COM master ($30,000 for 1 million unique titles, or $15,000 for 1/2 million unique titles). Copies of the COM catalog would cost $140 to $280 each, beyond the costs of the COM master.

For subsequent versions of the UCONN catalog the cost is $0.05 per OCLC record processed plus $0.05 per new title to update the file; added or revised holdings on new or old titles are free. The cost to update and merge the new UCONN records would, therefore, be in the range of $3,000-$4,000 per year and would be part of the on-going statewide data base activity. A new UCONN COM master would cost $15-$30,000. If 100, 200, or 300 copies of the catalog were distributed the cost of each copy would be $290, $215, or $190 for a 1/2 million title file, and $580, $430, or $380 for a one million title file. These costs include the cost of duplicating the COM file ($140 or $280 described above) and the COM master. (Given these cost figures, it may be useful for UCONN to consider an annual or semi-annual cumulative COM catalog to replace the card catalog. Catalog cards could still be ordered and filed in small supplementary card catalogs, and discarded each time a new COM catalog is issued. This would permit multiple copies of the catalog to be widely distributed, with all of the titles and holdings available except

for the most recent acquisitions. It may also be possible to use the weekly supplement system provided by the COM catalog vendor.

5.4 PHASE I DATA BASE

The over 2 million machine readable records represent somewhere between 500,000 and 1,000,000 unique titles. At this point, a COM output product can be created. A COM master is produced from the merged tape described above for $0.025 to $0.04 per record with copies at $0.20 per 1000 titles per copy. The current pricing strategy makes it less expensive to keep library master files physically separate for update purposes and merge the tape masters for regional and statewide catalogs when required.

5.5 ADDITIONS TO THE MACHINE READABLE FILES

Additional titles and holdings will be added to the statewide data base either through updating of the files with new records or retrospective conversion of older titles not in machine readable form.

5.5.1 Updating

At the present time the most viable sources of new data to be added to the statewide data base are new OCLC tapes and machine readable tapes of acquisition information acquired from large book jobbers.

5.5.1.1 Acquisition Tapes

Some libraries order a majority of their books from one or more large book jobbers; many of these book jobbers offer an additional service which provides full bibliographic acquisition tapes for all material purchased by a particular library. The cost of this service varies from no charge (free) to $0.15 per title ordered, depending upon the size of the annual book order.

It may be possible to use these acquisition records to update the library's circulation file in addition to the statewide data base. Assuming that a single COM vendor has been selected to maintain the statewide data base, an extension to this contract could provide a service where in addition to updating the statewide data base any records appearing as acquisition records for a specific list of libraries are also converted to CLSI (or GEAC, or Dataphase, etc.) format and sent to the specific library or consortium for addition to their files. The timing of the acquisition tape generation and the circulation file conversion is critical; it is not practical for libraries to wait 60 or 90 days to receive the circulation records.

5.5.1.2 Other Methods

It is also possible to use a special Optical Character Recognition typing element on an electric typewriter to type pertinent information which is then converted to machine readable form by a vendor's machine. LCCNs and OCLC numbers are used to match records in the master data base. This costs $0.05 per new title, with additional library locations free; once a title has been paid for, additional locations by the same or other libraries on the data base are free. It is not possible to use CLSI disk files for updating since there is, at present, no method of separating new additions from the old file, and it would be necessary to repeat the upgrading procedures for every CLSI title in each updating cycle.

5.6 RETROSPECTIVE CONVERSION

It will be necessary to add holdings and titles of already-acquired material if the statewide data base is to be most useful. The choice of which holdings and titles to convert has been discussed earlier; methods of this conversion will be discussed here. Each of these methods is, to some extent, dependent upon matching the record to be converted to the record on the existing statewide data base or a source file. The most readily available field for matching is the Library of Congress Card Number (LCCN). The International Standard Bibliographic Number (ISBN) tends to be more accurate than LCCNs printed in books, but ISBNs are not available for older material.

Every library, regardless of size or retrospective conversion priority, should immediately begin to note LCCNs and/or ISBNs on all of the new or revised manual records of the library collection, preferably as part of the shelf list.

5.6.1 OCLC Retrospective Conversion

The current rate structure of OCLC encourages the use of OCLC for retrospective conversion. Machine readable records for the converting libraries are available on magnetic tape, but no cards are produced. The unused time on the existing terminals at the nineteen OCLC libraries could be utilized for this purpose, or new terminals could be purchased (or borrowed) and installed for the period of retrospective conversion at core libraries. (see Sections 7.1.3 and 7.1.3.1 for more information)

5.6.2 OCR and Related Technology

An Optical Character Recognition typing element on an electric typewriter can be used to type matching information (LCCN, main entry, title) and local information (call number and location statement) for each title to be converted. A vendor's OCR reader translates the OCR typing to a machine readable tape and a procedure similar to that of upgrading records is begun. Because OCR is prone to errors, particularly if the typewriter is not in perfect alignment or if the typist must make many corrections, some vendors are investigating the use of terminals with built-in microcomputers to replace OCR. Small, inexpensive microcomputer terminals with a magnetic diskette are programmed to accept the needed information and transfer it to the diskette. The diskette may be mailed, or the information on the diskette may be transmitted by telephone, to the vendor to begin the matching process. Once the technique is developed, the State Library could purchase several microcomputer terminals and loan them to various libraries for the conversion period. (It is possible that rental of the microcomputer terminals may be offered by the vendors.)

5.6.3 Book Jobbers

Some book jobbers, particularly those used by academic libraries, have available machine readable records of previous purchases which can be provided with or without full bibliographic information.

5.6.4 Manual Matching

It is also possible to manually match titles held by a library against the microform product of the statewide data base. Each record in the statewide data base would have a unique identification number with a check digit. The converting library would record these numbers for matches; if necessary, OCR or microcomputer input could be accomplished at a central site from worksheets. Non-matches could be saved for a later attempt at a match, or a full bibliographic entry could be created using one of the above methods. This method is labor intensive, but may be appropriate for smaller libraries. The input process can be accomplished over many months; some libraries have successfully used volunteers for the clear-cut cases (using an exception system whereby the questionable matches are referred to library staff). A microcomputer terminal at a central site could serve as the actual input device for many smaller libraries.

5.7 ADDITIONAL USES FOR THE DATA BASE

The proposed data base has full bibliographic information for each title. This information is only collected, keyed, and stored once and is analogous to a unit card in a card catalog. However, every piece of information in the record is not needed for every application. Just as a circulation record can be expanded to full MARC format, so can sufficient data be extracted from a MARC record to create another library's circulation file. These full records can also be used to completely replace a card or book catalog in an individual library, by building a machine readable file from records converted by another library.

This data base, however, is not useful as a cataloging tool to produce cards, in most instances. There is not only a time lag before

publication of the data base, but the microform format is not easily converted to 3 X 5 form except with extra equipment. The data base may be used as a source of bibliographic information, but should not be thought of as a major cataloging tool.

5.7.1 Conversion to a COM Catalog

Once a library has full bibliographic and holdings records for the entire collection on a COM catalog, it is a reasonable step for the library to take to make the COM catalog the official catalog of the library and eliminate the card catalog. The tradeoffs to be made include the cost of the COM catalog master and copies, the cost of updating the catalog, and the cost of microfilm and/or microfiche readers, versus the current cost of obtaining catalog cards, filing, storage, etc.

Some of the COM catalog vendors provide authority files and authority control services for the libraries; many libraries have used this opportunity to convert to LC authority files, then eliminated their card catalogs, and use the COM catalog as the patron catalog. These vendors are also prepared to convert to AACR2 authority files. This could be done automatically to a library's file and the next edition of the COM catalog would have the new AACR2 terms in place of the old AACR terms, as indicated on Library of Congress authority tapes. The conversion of a library's catalog from AACR to AACR2 without the need for any appreciable library staff time is another major benefit of automation and a statewide data base.

PART III

CURRENT PLANS AND FUTURE SYSTEMS

The current automation activities of Connecticut libraries and the need for a statewide data base as a resource file for the generation of regional and statewide COM catalogs, circulation files, and on-line catalogs were described in Part II.

Part III describes the current automation plans of some of the Connecticut libraries to acquire new systems or expand the use of present systems. Recommendations for the acquisition of new systems are included, as are recommendations for improved use of existing cataloging, circulation, acquisition, serials, and search services.

Chapter 6

CIRCULATION SYSTEMS

6.1 CURRENT PLANS

Several libraries are planning to acquire circulation systems for their own library or for a regional consortium. New Haven Public Library, Southwestern Connecticut Library Council (SWLC), Capitol Region Library Council (CRLC), and Yale University are in various stages of planning, budgeting, vendor selection, and installation. Over the next several years many additional libraries and regions will be in the position of selecting a circulation system.

This chapter presents a selection process which Connecticut libraries should follow in order to improve the probability that the system selected will indeed meet their needs. When a formal selection process, such as the one presented in this chapter, is not followed, the library or consortium often obtains and installs a system which, after several months of operation, is found to be inadequate. In an attempt to prevent this situation from occurring in Connecticut libraries, specific procedures are recommended, cautions are offered, and a proven sequence of activities is described.

6.2 SELECTION CONSIDERATIONS

The selection of a circulation system is one of the most critical decisions a library can make. The system, as delivered by the vendor, could cost in the range of $125,000 to $750,000; in many cases the purchase price may not be the major cost of the system. The cost of retrospective conversion to create the circulation file, and the on-going operational costs of staff labor and maintenance could each exceed the purchase price of the system.

6.2.1 Missing Features or Services

In many cases the vendor's system does not provide all of the features and the capacity that the library requires; many current users of circulation systems have found themselves in the position of expecting certain features of a system to be available "soon" after they purchased their system, only to find from later experience that the feature or service is years away. The library may be in a difficult position if the missing service was critical to its operation, and the vedor's commitment to supply this service was used as a basis for selecting a particular vendor.

6.2.2 Inadequate Capacity

Another very serious problem that libraries have experienced with automated circulation systems is the lack of adequate system capacity to perform the required library functions at the level of activity required by the library. When this occurs, the system is overloaded; the operational capacity of the system has been exceeded and the effect on the user is slower and slower response time. When the response time becomes so slow that the library cannot get its work done, the library is faced with the choice of abandoning the system or purchasing additional hardware (terminals, disks, etc.) or a larger computer; in most cases the latter choice is selected, and new unexpected costs are incurred.

This addition of new equipment or upgrade of existing equipment due to inadequate capacity occurs in a large percentage of the existing installations, with various vendors' systems. In some cases, the library has underestimated the number of titles, patrons, circulation load, etc., or has expanded the use of the system by adding additional libraries on the system; in these cases the library has been responsible for exceeding the capacity of the system, and therefore responsible for the extra cost.

The situation to avoid is the one beyond the library's control where the library has clearly stated the functions required (checkin, checkout, holds, fines, etc.), the activity on the system (1.5 million checkouts, 10,000 fines, 20,000 new or changed patron records, 15,000 new titles per year, etc.), the response time required (2-5 seconds to checkout, 5-10 seconds to search, 5-6 seconds to add a new title, etc.),

and the vendor guarantees that the system, with the configuration and cost proposed by the vendor can meet these requirements -- and it doesn't. This has occurred all too often in unsuspecting and unprepared libraries, and is most likely to occur in systems where there will be a high transaction volume, such as large library systems or shared circulation systems similar to the ones proposed by the CLSUs. Benchmark and acceptance tests must be required in order to prevent this situation from occurring in Connecticut installations.

The resulting additional cost to upgrade the system, plus the additional staff time required to deal with the slow response time, can be avoided if the system requirements are adequately defined and the vendor is required to prove that the proposed system can handle the expected load; this can be accomplished as part of a benchmark test and is defined in the following sections.

6.3 THE SELECTION PROCESS

The selection process described in the following sections should be used for the purchase of any turnkey system (where the equipment is owned by and will reside in a library or its data processing center); in a turnkey system, the vendor has designed the system, written the software, installed the system, and trained the library staff. Circulation systems fall in this category; on-line catalogs, when they are available, will also fall in this category.

The process is accomplished in a series of steps, each step building on the results of the previous steps.

6.3.1 Transaction Volume

The library or consortium requirements are defined in terms of unique titles, volumes, patrons, circulation transactions (checkout, checkin), fines, holds, recalls, reserves, etc. The annual volumes and/or changes to these figures are determined (new titles, discards, patron changes, new patrons, new volumes, etc.).

6.3.2 Locations

The number of automated circulation locations at each library and branch is defined, taking into account the number of exits, book drops, etc. The library should determine the approximate transaction load that occurs at each location and the hours each location is in operation.

6.3.3 Average Hourly Load

The average hourly transaction mix is then calculated by dividing the annual transaction data (i.e., 2 million checkouts, 10,000 new titles, etc.) by the annual hours of operation for a particular transaction type (60 hours per week x 52 weeks per year = 3120 hours per year for circulation, 20 hours per week x 48 weeks per year = 960 hours per year for material updates, etc.) to determine the average hourly transaction rate (2,000,000 checkouts/3120 hours = 641 checkouts per hour, 10,000 titles/960 hours = 10.4 new titles per hour). Average hourly transaction rates should also be calculated for item searches, patron searches, title searches, subject searches, fines paid, reserves placed, holds placed, etc.

6.3.4 Peak Load

Given the average hourly load calculated above, an estimate must be made of the peak load. The peak load may occur at a specific time in the evening at a public library, or the week before finals at an academic library. The peak load is generally from 2 to 10 times the average load (except for very small average loads where the peak load can be a much higher percentage). It is difficult to estimate the peak load; the library staff should attempt to make the best estimate possible. It may be possible to measure or count the peak load by observations. In the case of defining the requirements, it is better to estimate on the high side rather than the low side.

6.3.5 Write the RFP

The next step is to write a Request for Proposal (RFP). The RFP should describe all of the features and services the library requires of the system; each feature/service should be designated as mandatory, essential, desirable, or useful (or any other set of terms which will be defined by the library). There are many excellent RFPs which have been developed by other libraries, and can be used as models; a clearinghouse of samples RFPs should be established by the State Library. An example of a circulation system RFP covering all of these subjects in detail is the "State of Wyoming, Department of Administration and Fiscal Control, Request for Proposal Number 0606-J". Copies of this RFP may be obtained from the Connecticut State Library, (Planning and Research). The sample RFP is one of the few RFPs that defines the use of a single system to be shared by multiple libraries and multi-type libraries; consideration is also given to the interface between the circulation system and cataloging (OCLC), COM vendors, retrospective conversion vendors, and other circulation systems.

It is vital for the library or consortium to produce a formal written RFP; the use of questionnaires, interview forms, and telephone or personal conversations is not sufficient to select the vendor of a major system. The principal purpose of an RFP is to obtain formal written proposals from several vendors; these proposals describe the vendor's product in terms the library should understand.

6.3.5.1 Transaction Mix

Included in the RFP should be a listing of the per hour average and peak load requirements for each type of transaction as defined above. This is a very important part of the RFP. Without this table the vendor and the library do not have sufficient information to determine, prior to system installation and actual operation, whether the system will handle the library's load. With this table, the library will be able to test the vendors product prior to acceptance of the system and payments to the vendor.

6.3.5.2 Response Time

The RFP should also include the response time requirements for each type of transaction, for both average and peak load (i.e., searching: 5 seconds for the average load and 10 seconds for the peak load, and checkout or checkin: 2 seconds for the average load and 5 seconds for peak load, etc.)

6.3.5.3 Interfaces with Other Systems

The circulation system should at a minimum be able to interface with other circulation systems in the state. Interfacing with another system by the same vendor may not be very difficult; interfaces with different vendors will be difficult. The RFP should define the vendors already in the state and require the selected vendor to demonstrate the on-line interface including the ability to search and initiate an ILL transaction. Vendors may be somewhat reluctant to provide this type of interface due to the complexity of the development and their perception of the impact on their market share if the interface was available. If the libraries insist on the interface, and withhold substantial payment until the interface is available (or disqualify a vendor who will not provide the interface), the vendors may be encouraged to develop the necessary interfaces.

There is a similar requirement for an interface between the circulation system and the major acquisition (book jobbers), COM, and retrospective conversion vendors. In a few years there will be a need for an interface with on-line catalog vendors. The circulation vendors should be encouraged to develop these interfaces with the major vendors of these services.

6.3.6 Evaluate the Proposals

The vendors tend to portray their product in the most favorable light. This is quite reasonable; unfortunately, some vendors also tend to exaggerate the functions of the product, write the text in such a manner that it is difficult to determine whether something is available now or will be available someday, and omit the product or service deficiencies.

The RFP can tend to reduce some of this confusion (See Section 2.2 of the sample RFP). Detailed telephone interviews with several current users of each vendor's product will likely uncover some of the major advantages and disadvantages of each product. The use of a formal RFP will let the vendors know that they are in a competitive situation; the vendors are much more likely to minimize their prices and agree to user provisions in the RFP in a competative situation. This factor alone justifies the effort of producing a formal RFP.

The vendors' proposals should be reviewed, evaluated against a predetermined set of weighed evaluation criteria (users should be contacted as part of the evaluation process), and a vendor selected.

6.3.7 Additional Considerations

When evaluating proposals from different vendors consideration should be given to other existing circulation systems in the state; there are several CLSI systems in operation, and two CLSUs and Yale are negotiating contracts with GEAC. The experiences of the CLSI and GEAC libraries should be carefully reviewed; more information and measurement data will be available from the GEAC libraries in approximately one year. For ILL purposes it will be easier to communicate among systems of the same vendor than among systems of different vendors (which may remain incompatible for several years). The same is true of obtaining a copy of another library's title file from their circulation system for retrospective conversion purposes - it will tend to be easier to copy and use a file from the same vendor's system.

This recommendation should not be interpreted as a recommendation for vendor conformity; there are many other independent factors to consider which include system features, initial and on-going operating costs, level of performance for the projected workload, satisfactory benchmark testing, existing users' evaluation of vendor and system capabilities and performance, etc.

6.3.8 Benchmark Test

The RFP should also define the acceptance criteria for the system, including benchmark and acceptance testing. After the library has

reviewed the various vendor proposals and has selected a single vendor, the vendor, at the vendor's expense, must perform a benchmark test on existing equipment at the vendor's site or an existing user's site. The vendor should load title, item, and patron files equal to or greater than those of the library to be tested. Sufficient terminals, patron cards, books, etc., should be available to conduct the test. At some convenient time when the host system (at the library or vendor site) is available for testing for a period of a few hours, the staff from the testing library, vendor staff, and possibly staff from the host library, should perform the live benchmark test by checking in, checking out, adding patrons and titles, performing searches, placing holds, processing fines, etc., according to the average transaction mix table. If the average hourly transaction load cannot be processed in one hour, the proposed configuration and system proposed by the vendor will not be adequate for the library; at this point, the library could request the vendor to upgrade the proposed configuration and revise the cost estimate, or be disqualified. The same test should be conducted for the peak load, with the same consequences of successful or unsuccessful test results.

Benchmark testing is the only link between the requirements of the user and the system proposed by the vendor. The vendor translates the user's requirements and functional specifications into an actual hardware and software configuration. The user must independently determine that the hardware and software proposed will fit his requirements BEFORE the user invests heavily in site preparation, file conversion and bar code labeling, staff training, and any direct payments to the vendor. If the user installs the proposed configuration without a benchmark test and the system cannot meet the user's workloads, it is the user, not the vendor, who must pay for additional equipment. Although vendors do not encourage benchmark testing, it is the only way to be certain that all of the bid responses fulfill the requirements, and it is a common practice in non-library data processing. (For a discussion of theoretical versus actual system capacity, see Section 4.3.1 "System Capacity - A Note of Caution".)

6.3.9 Acceptance Test - Contract Provision

After successful benchmark testing at average and peak loading, the library could proceed with contract negotiations, with the understanding, as part of the contract, that the vendor still must pass an acceptance test before the system will be accepted and any monies

paid to the vendor. Remember, the library, not the vendor, defines "acceptance".

6.3.10 Contracts With The Vendor

In most cases, the vendor will offer a "standard" contract for the library to sign. Don't. The vendors contract is written for the advantage of the vendor. Carefully read the vendor's contract, define what is to be added, changed, or deleted, and present the ideas to your own legal counsel. Make the necessary revisions to the contract prior to signing the contract. There is an excellent primer on contracts with vendors, including many practical examples, called "The Joy of Contracts" written by Kevin Hegarty, Director of the Tacoma Public Library. This document is also available from the Connecticut State Library.

6.3.11 Acceptance Test

An acceptance test insures that the configuration installed by the vendor fully meets the user's functional and performance requirements. Acceptance testing occurs on new equipment installed in the testing library's facility; this is the equipment and configuration that the library will purchase and own once the library has accepted the system and paid the vendor. Prior to the installation of this equipment, the testing library should have converted all or a major portion of its title, item, and patron files. See Chapter 5 for a description of retrospective conversion methods.

The library should load its own files, set up its own tables for locations, security codes, holidays, patron types, loan periods, fine structures, etc. If the owner of the new system is a consortium, the tables should include separate title, item, and patron files for each library, as well as separate tables.

After installation of all of the central host equipment, terminals, and communications equipment at all or a portion of the library locations, the library should load its own files and conduct the live acceptance test. If the files are not complete, the library should load dummy data from another library; the file sizes in the acceptance test

should be equal to or greater than the size of the ultimate operational files. The acceptance test is similar to the benchmark test, except that the equipment is installed in the testing library; the files are its own, the books, patron cards, etc., are also its own. All functions and services of the system should be tested as well as the performance. The consequences of successful/unsuccessful testing are the same as in the benchmark test. The system is not accepted or any payments made until the average and peak load tests are successful. If the vendor cannot meet these requirements, the vendor must remove all the equipment at no cost to the library, and the library is free to select another vendor.

The rigid constraints on the acceptance are critical for the library. Once the system is accepted and the vendor has been paid, the library has very little leverage to influence the vendor, remind the vendor of verbal, written, and proposal commitments, etc. The library is much better off to test the full system on its own hardware installation and assume that any future system improvements are enhancements and not critical to the current operation of the system.

6.4 RECOMMENDATIONS FOR CIRCULATION SYSTEMS

6.4.1 Existing Systems - CLSI

There are several changes and new procedures that can be adopted by the libraries with automated circulation systems.

6.4.1.1 On-Line Interface to Cataloging Systems

Libraries with both CLSI circulation systems and OCLC cataloging systems should investigate the on-line interface products which connect the two systems; these products read the bibliographic and holdings information from the OCLC terminal and transfer the data to the CLSI circulation files. These products are in the $15,000 range and eliminate the need for library staff to rekey the data in the CLSI system. Greenwich Public Library is an early user of this interface product and should be contacted by any library considering this purchase.

When there is enough of a market, the vendors may build an interface from RLG/RLIN (or WLN) to CLSI, and possibly to other circulation vendors such as Dataphase, GEAC, etc. The two current interface vendors are Innovative Interfaces Inc., Berkeley, California, and TPS Electronics, Palo Alto, California.

6.4.1.2 On-Line Interlibrary Loan

The libraries using different CLSI systems should add the dialup feature to their systems where it does not currently exist and expand the use of the interlibrary loan capability of the CLSI System. This capability will become much more valuable with the generation and distribution of the statewide data base on COM.

6.4.1.3 Circulation to Catalog File Conversion

As part of the statewide data base activities, the State Library should obtain a statewide contract from a conversion or COM vendor to convert the Connecticut CLSI circulation files into full bibliographic records. Libraries with CLSI systems should submit a copy of their files to the vendor; after retrospective conversion the vendor may then send a tape or COM catalog copy of the full bibliographic and holdings records to the CLSI library or consortium, and duplicate another copy of the tape for the statewide data base. Copies of all of the CLSI user records can be merged into a single COM catalog and distributed to all CLSI libraries for use as an ILL finding tool. As an alternative to merging all CLSI files, it may prove more feasible to send copies of the individual or system-wide COM catalogs to the other libraries.

6.4.2 Existing Systems - UCONN

The UCONN library should replace the present outdated punched card circulation system with a commercial vendor's circulation system; these systems can now handle full bibliographic records with limited (due to transaction load performance) library staff and patron searching by author, title, subject, etc. Terminals could be installed on all floors

of the UCONN library. Several systems provide the capability of supporting multiple libraries, each with their own patron and title file, etc.; this would give UCONN the option of providing circulation services on a network basis to other libraries in the same geographic region or other academic libraries. This option should be seriously considered by UCONN, since the incremental cost of a larger system, including acquisition, conversion, and operation of the system could be considerably less than another library acquiring a second system - providing that the expanded system can actually handle the combined workload, and telecommunications costs (telephone lines) do not make a combined system more expensive than two separate systems.

Chapter 7

BIBLIOGRAPHIC UTILITIES, BROKERS, VENDORS, AND CONSORTIUM

7.1 OCLC

7.1.1 Current Status

OCLC as a bibliographic utility is supplying a major portion of the cataloging for Connecticut libraries. Over 180,000 titles are cataloged each year using the OCLC system. OCLC/MARC tapes are being sent to NELINET for these libraries. OCLC has recently begun the processing of archive tapes and NELINET should be receiving the first of these tapes shortly. The on-line interface between OCLC and CLSI circulation systems is working in several libraries, including Greenwich Public Library, and being installed in several others; no additional on-line interface installations are currently planned for Connecticut Libraries. The OCLC ILL system is expanding month by month as libraries are turning to OCLC for processing and transmitting their ILL requests.

7.1.2 Recommendations for Statewide Use of OCLC

1. Statewide procedures for ILL should be revised to account for the increasing availability of holdings information on the OCLC files.

2. Libraries with sufficient funding to support on-going operational OCLC costs should be encouraged to join OCLC, assuming their long-term costs and benefits favor OCLC. High priority individual libraries, such as the State Colleges, should receive startup costs (approximately $5000 each) to cover training, profiling, and one terminal.

3. CLSUs should be encouraged to set up OCLC processing centers on behalf of member libraries, similar to the SWLC service if

it can be shown that the annual on-going operational costs can be supported by the members. If state funding is available the startup costs of $5000 (approximately) for a terminal, profiles, training, etc., should be offered to the CLSU.

4. One library or the CLSU in each region should coordinate ILL location information or requests on behalf of libraries in that region.

5. There should be at least one OCLC terminal in each region; if there are no OCLC terminals in a region, special financial support should be provided for the CLSU or one library in the region to join OCLC and obtain a terminal. An alternative is to route ILL requests to the State Library which would add more work and time delays. ILL is best served library to library.

   COST ESTIMATE: $5000 for terminal, startup, and training.

6. The State Library as coordinator for the statewide data base should request a Connecticut-OCLC tape from NELINET. This tape should contain all records from Connecticut libraries in the same sequence these records appeared on the tapes. NELINET should be instructed to forward a copy of Connecticut records that are received as a result of the archival runs.

7. The State Library and the Automation Coordinating Committee should select a COM vendor and forward the OCLC tapes for merging of duplicate records and holdings, the generation of a test COM catalog, and finally a production COM catalog. This COM catalog will contain well over 500,000 Connecticut holdings, from a variety of sources, and should be distributed to OCLC and non-OCLC libraries.

8. OCLC libraries with CLSI systems should consider the acquisition of the on-line interface hardware to convert data from the OCLC screen to the CLSI circulation file, as Greenwich Public Library has done. The cost trade-off should consider the cost of the hardware and the cost of rekeying the data into CLSI, or the cost of converting the OCLC records on a delayed basis.

9. The Connecticut OCLC libraries should request the NELINET director to try and influence OCLC into accepting the future RLG/RLIN records from Yale, if available from Yale, and load

them into the OCLC data base to make the data available for on-line access by Connecticut libraries. (See section 7.2)

10. The Connecticut libraries should also request a copy of the Yale RLG/RLIN tapes from Yale for inclusion in the statewide data base and statewide COM catalog.

11. The Connecticut Union Catalog (CUC) is a manual card file used to locate in-state sources of ILL materials. This file is heavily used as a second source of location data (the OCLC file is searched first since more Connecticut holdings are on the OCLC file than the manual card file). The manual CUC should be converted to machine readable form as an OCLC retrospective conversion project and made part of the statewide data base. The CUC should receive a very high priority for conversion. Once the CUC has been converted, the manual CUC can be eliminated, along with the costs of manual maintenance and searching.

7.1.3 Retrospective Conversion on OCLC

With the present state of technology and vendor products and services, the authorized OCLC retrospective conversion projects represent the most cost-effective method of retrospective conversion. After locating a bibliographic record on the OCLC data base (approximately 75-90% of the time), the user adds the local call number and holdings data; for the remaining titles (10-25%) the user keys in the bibliographic data as well as the local data. As a result, OCLC processes the data and sends the library a magnetic tape with both bibliographic and local data, but no catalog cards. This tape can be used for a variety of purposes, including addition to the statewide data base.

The OCLC cost for the retrospective conversion activity is minimal - approximately $0.05 per record for the magnetic tape. There is no OCLC charge for processing, searching, etc. The other costs to the library are the OCLC terminals required during the time period of the conversion project, and the library staff to perform the conversion activities. The library may calculate the staff time required for conversion by assuming the rate of 20-30 titles per hour per terminal; the 30 title per hour rate is possible if the library has a very high hit rate and does not make changes to the bibliographic record.

Connecticut libraries which are members of OCLC should be encouraged to participate in an OCLC retrospective conversion project as soon as possible.

7.1.3.1 Floater Terminals for Conversion

OCLC terminals cost approximately $4000, including installation. Several libraries will need multiple terminals for retrospective conversion, and the terminals will not be required after conversion. In order to take advantage of this situation the State Library should purchase several OCLC terminals and use them as "floater terminals" by loaning them to the libraries during the retrospective conversion project; when one library's project is completed the terminals would be removed and reinstalled at the next library. The floater terminal concept is a much more cost effective procedure than for each library planning a retrospective conversion project to obtain a one-time budget from LSCA, the state, or their own institution.

COST ESTIMATE: $40,000 - $80,000 (10-20 terminals)

7.2 RLG/RLIN

7.2.1 Current Status

Yale University is in the process of converting from OCLC to RLG/RLIN as a cataloging utility. Yale will be cataloging approximately 100,000 titles per year on the RLG/RLIN system beginning in 1980. Several other research libraries are converting to RLG/RLIN from OCLC; as a result many hundreds of thousands of bibliographic records will be added to the RLG/RLIN files and not be available on the OCLC files. Several Connecticut OCLC libraries may be affected by this migration; the major impact will be at UCONN, with a lesser impact at some special libraries, and some larger public libraries.

7.2.2 Access to RLG/RLIN Records

RLG/RLIN provides a special service called "Search Only" service which permits libraries which are not RLG/RLIN cataloging libraries to open an RLG/RLIN searching account and search all of the RLG/RLIN files and display (print out) the desired bibliographic records. This service costs approximately $30 per hour and is accessible through TYMSHARE (TYMNET) using any normal terminal with a dial-up capability. It is expected that 10-20% of the current cataloging records not found on OCLC may be found on the RLG/RLIN data base. Depending upon the speed of searching, these records may be retrieved for $2.50 - $5.00 each (search 10 titles and find 1 or 2).

Access to RLG/RLIN records is available through a variety of indexes, including subject headings, title words, and individual words in an agency name. Some OCLC libraries with RLG/RLIN Search Only accounts use RLG/RLIN files to locate a particular record which is difficult for the library to find on the OCLC files due to incomplete information at the library, difficulty with some OCLC search keys which provide excessive hits, etc. After locating the RLG/RLIN record and noting some numerical identifier such as the Library of Congress card number, Superintendent of Documents number, ISBN, ISSN, etc., the OCLC library would search the OCLC files using one of these terms to locate the desired record. If the record is not in the OCLC file, the OCLC library could proceed to key in the full record, since the full RLG/RLIN record could have been printed out on their search terminal.

7.2.3 Recommendations for Limited Use of RLG/RLIN Search Services

1. The State Library and UCONN (or perhaps a special arrangement with Yale) should provide access to RLG/RLIN files for public and academic libraries respectively. The availability of one more bibliographic tool, which will have a higher and higher hit rate over the years, will be very valuable to Connecticut libraries. As CLSUs and local libraries begin to use commercial search services such as Lockheed, BRS, New York Times, etc., they might also consider offering bibliographic searching in RLG/RLIN.

2. NELINET should be requested to offer RLG/RLIN search service training to Connecticut libraries.

3. Since the RLG/RLIN files also contain detailed holdings information including copy, location, and call number data, the RLG/RLIN files can be used as a supplementary source of ILL information from Yale and out-of-state libraries. The same searching accounts, terminals, and procedures used for bibliographic searching can also be used to obtain ILL information. RLG/RLIN does not have an automated ILL process like OCLC; traditional mail, telephone, or TWX procedures must be used to request the material. The State Library, UCONN, and perhaps the CLSUs, should offer ILL location services on RLG/RLIN for public, academic, and regional libraries in Connecticut.

4. Reference staff at some Connecticut libraries should consider RLG/RLIN search services to discover the existence of non-known item material since the RLG/RLIN files can be searched by subject headings, full or partial call numbers, etc.

7.3 WLN

7.3.1 Current Status

The Washington Library Network (WLN) is a bibliographic utility serving libraries in the Pacific Northwest. The WLN system includes a very powerful authority file and authority control component. Searching is available through any authority file term, numeric identifiers (LCCN, ISBN, etc.) and title keywords. WLN does not offer non-member searching accounts.

7.3.2 Replication of the WLN System

One of the most unusual aspects of the WLN system is that it is available for replication under a license agreement. At the present time, the National Library of Australia has replicated the WLN system and has been testing the system for several months and SOLINET has licensed the WLN software for conversion to the SOLINET computer. Several other large libraries and network brokers are also considering obtaining a copy of the WLN system for their own use. NELINET is one of these organizations seriously evaluating the WLN system and making preliminary plans for its use.

Operating the WLN system requires the use of an IBM 370 or compatible computer. Any agency considering WLN must have access to or obtain a computer, hire and train operators, systems programming and applictions programming staff, etc.

If NELINET were able to install and operate the WLN system there could be a wide variety of services offered, including authority control, acquisitions (ordering, receiving, claiming, etc.), fund accounting, cataloging, and reference searching. By loading the New England OCLC tapes the system files could contain local information including location and call number data.

7.3.3 Recommendations for Potential Use of WLN System

If NELINET makes the decision to install the WLN system, the libraries in Connecticut should review the NELINET service plans, priorities, potential schedules, and price structure. A review of potential services beyond current OCLC services should be reviewed with respect to the NELINET price and the present cost of performing the similar service. Other advantages such as faster service, more accurate data, and access to local data should also be considered.

Connecticut libraries should also consider the addition of the remainder of the statewide data base (CLSI, UCONN, other) on the NELINET/WLN files. This would provide limited on-line access to local information. The limitations are primarily ones of capacity of the central computer system, costs of services, and costs of access.

One of the technical and economic difficulties which any potential WLN installation must face is the physical access to the computer and files by library terminals. If OCLC permits the on-line interface between its own future Remote Communications Processor (RCP) and the NELINET computer, all OCLC terminals in New England, including the Connecticut terminals, would have access to the NELINET computer. If, on the other hand, OCLC felt that the NELINET computer would offer competing services either now or in the future, OCLC might well prohibit the interface. This situation would require all libraries, including OCLC libraries, to access the NELINET computer by using non-OCLC terminals, non-OCLC communication lines, etc. The cost of a second communications network would be very expensive to operate, and the additional operational costs would have to be borne by the user libraries.

7.4 NELINET

7.4.1 Current Status

NELINET is currently a broker of OCLC services, supplying network services such as training and installation support to New England libraries. NELINET also pays for the communications lines from terminals throughout New England to the OCLC computers in Columbus, Ohio; these communications costs are then reallocated to OCLC libraries on the basis of usage of the cataloging system.

7.4.2 The Replication Decision

The previous section described the potential of NELINET selecting and installing the WLN system and offering services throughout New England. NELINET is currently in the decision making process; Connecticut libraries should review the current status and provide feedback to NELINET where possible. The feedback should be in the area of reactions to potential services, costs, etc., and the feasibility of utilizing and paying for these services; the feedback should be as realistic as possible, but in no way should it be taken as a commitment to use these services.

7.4.3 New England Data Base

Recent plans by NELINET include the possible development of a New England data base created from OCLC tapes and other sources. When the New England data base is implemented Connecticut will be an integral part of it. Until that time Connecticut libraries should proceed on their own schedule with plans for a statewide data base. When Connecticut libraries are ready to make a decision on the management of the statewide data base, NELINET, in addition to the State Library, the University of Connecticut, a CLSU, a non-profit corporation, or a statewide consortium, should be considered as a possible contractor.

7.4.4 Recommendations for NELINET Services

1. NELINET should offer RLG/RLIN search service information and workshops. NELINET should assist those libraries that wish to use RLG/RLIN search services by opening RLG/RLIN accounts and conducting training sessions.

2. NELINET should extract Connecticut records from the OCLC tapes and send the new tapes to the State Library (or to UCONN) for retention and storage.

3. As new OCLC archival tapes are received from OCLC, the Connecticut records should be extracted and sent to Connecticut.

7.5 VENDORS OF ON-LINE CATALOGING SYSTEMS

7.5.1 MINIMARC

The MINIMARC system marketed by Infomatics is a mini-computer based turnkey cataloging system. LC MARC records are stored on hundreds of floppy disks with one or two floppy disks added each week, and an index to these records stored on microfilm, which is updated weekly. When a library wishes to catalog a particular title the microfilm is accessed to determine which floppy disk contains the required record, the correct floppy is loaded into the computer, the required record copied on the terminal screen, and the library makes any necessary modifications to the record. When processing is completed, a set of catalog cards is produced by a printer attached to the mini-computer.

This system is somewhat slow due to the need to manually select and insert the proper floppy disk for each record to be cataloged. However, the system is not every expensive; at a cost of under $50,000 to purchase plus $4,000-$5,000 per year for maintenance, several libraries who would have a high hit rate on MARC records could share the system and bring the cost to under $0.50 per record, including catalog cards. Some libraries would have to travel to the minicomputer site at one of the libraries on a shared basis, since the system does not support remote terminals, and the system cannot be moved easily to another location.

The MINIMARC designers are considering replacing the hundreds of floppy disks with single videodisk - which would remain in the computer all the time, until it would be replaced by the next week's cumulative MARC file. It will take several years and some advancements in videodisk technology for this new product to be available. If and when the product becomes available, a few small to medium-sized libraries in a region could make effective use of such a catalog system.

There is also an on-line interface between MINIMARC and the CLSI system allowing user modified MINIMARC records to be added to the CLSI files.

7.5.2 Circulation System Vendors

The Dataphase circulation system contains software which allows an external resource file to be loaded into the disk files, records can then be selected from this file, modified by the library, and stored in the circulation file.

This process has been used for retrospective conversion, but this same software could be modified (although it has not been to date) to load MARC tapes from LC and perform current cataloging. One reason current cataloging has not been implemented on a circulation minicomputer is the capacity limitations of the system (see Section 6.2.2). If more powerful minicomputers become available, it is quite possible that a library may be able to perform current cataloging from MARC on the same computer as the circulation system. These expansions of circulation systems do not produce catalog cards as do the bibliographic utilities, and, thus, would only be suitable for libraries which require machine readable catalog records for COM catalogs or a future on-line catalog.

Chapter 8

ACQUISITION SYSTEMS

8.1 THE CATALOGING UTILITIES

8.1.1 WLN

At present there are very few on-line acquisition systems in operation. WLN has one of the most comprehensive acquisition systems including ordering, receiving, claiming, cancellation, fund accounting, and an automatic two-way interface to the catalog files. The WLN system is not available in Connecticut unless NELINET makes the decision to replicate WLN for New England, install the system, offer acquisition services, and resolve the communication problems. The services, opportunities, and barriers to replication have been discussed in Sections 7.3 and 7.4.

8.1.2 RLG/RLIN

The RLG/RLIN system has a prototype acquisition system operating at Stanford University; the system is similar to WLN's without the fund accounting. RLG/RLIN is expected to revise the acquisitions software and make it available to its members sometime after 1982; Yale University is expected to utilize this service.

8.1.3 OCLC

OCLC is currently designing and developing the OCLC acquisitions system. The system is expected to be implemented in a series of phases, with the first phase beginning field testing at a few libraries, including the Connecticut State Library, about June 1980. After the

field testing the State Library should write an evaluation report for distribution to Connecticut libraries; the report should describe how well the system performs, its strengths and weaknesses, the turn-around time for printed documents, the accuracy of the claim cycle, the impact on book delivery schedules from the vendor, anticipated staff savings, etc. After OCLC's revisions to the first phase as a result of field testing, the system should be generally available sometime in 1980 or 1981. When the system becomes generally available, each OCLC library should determine if the new acquisition system meets their needs, is reasonably priced, and can be supported by the library's budget.

8.2 THE CIRCULATION VENDORS

Several of the circulation vendors have plans for, or are in the process of, developing acquisition systems as an additional service to be performed on the same computer as the circulation system. In most cases the addition of a second application (acquisitions) on a circulation computer chosen to handle the circulation load will cause additional capacity problems (See Section 6.2.2 - Inadequate Capacity).

CLSI has general plans to use their new generalized software (Release 25) to perform automated acquisitions. CLSI is presently concentrating on developing and optimizing the new software for circulation purposes; the acquisition system will probably not be available for general use (beyond the first testing libraries) until 1981 or 1982.

Dataphase has a contract with Atlanta Public Library to provide an acquisition system on the same computer used for circulation. At the present time the functional specifications have been written and are being reviewed by potential users of the acquisition system. Completion of the development of the acquisition system to the point where it is generally available to users could be as early as late 1980, but more likely 1981.

The other circulation vendors are not as far along in planning for acquisitions, and are not expected to produce a production system in the near future.

8.3 BOOK JOBBERS

8.3.1 On-line Book Order Systems

Baker and Taylor and Brodart have on-line book ordering systems. A book ordering system is not the same service as a full acquisition system; an on-line book ordering system assists the library in producing detailed purchase orders and transmits the orders on-line to the book jobbers. A full acquisition system in addition to producing printed purchase orders (which must be sent by mail to a book jobber) also provides full and partial receiving, automatic claiming, cancelling, fund accounting, and in some cases encumbering and fund control. Each vendor is in the process of augmenting the on-line order system to add more of the functions of an acquisitions system.

The Baker and Taylor "LIBRIS" system and the Brodart "OLAS" system are functionally similar. The user searches a file of approximately 800,000 current titles for a particular title. For available titles, the user then adds a purchase order number, number of copies, location and shipping data, and some library internal data such as fund code, etc. Purchase order sets are printed at the terminal for the library's internal filing system, and the same information is transmitted on-line to the vendor's files. In some cases it is possible to use the book ordering system to print the purchase order set which will be mailed to another vendor; it is not mandatory that the library order books from the on-line book order vendor.

In some case the title being searched is in the file but is out of print or must be ordered directly from the publisher. The system will inform the user; in the latter case the user may print out a purchase order set and send it to the publisher.

The cost structure of LIBRIS and OLAS include a basic monthly fixed fee dependent on the volume of book orders; this fee includes the terminal rental and some number of connect hours. The vendors can also offer an alternative fee structure which includes a lower fixed monthly fee plus an hourly rate for each connect hour. Both systems are relatively simple and rapid to operate; after the user is logged on to the system, a set of multiple copies of the same title can be ordered in approximately one to two minutes including the printing of the purchase order set.

8.3.2 Package Bids

In many libraries using these systems the choice between LIBRIS and OLAS was not made on the basis of a feature-by-feature comparison of the systems, nor by the systems' cost; the choice was made as part of a book bid package. In this case the library specified the requirement for an on-line book ordering service as part of the selection of a book jobber. If Brodart won the contract on the basis of lowest total price, the library would use OLAS; if Baker and Taylor won, the library would use LIBRIS.

8.3.3 Additional Systems and Services

Baker and Taylor offers a batch acquisitions system called BATAB which operates on the user's own computer (the city, county, or academic computing center); since BATAB is a batch system, it will not be discussed in this report.

Brodart also offers an abbreviated book ordering system called "Book Express" which is less sophisticated and less expensive than OLAS. With Book Express the user indicates the title and number of copies required and the system responds with the number of copies currently available in the Brodart inventory. If the user orders the books, the copies will usually be shipped within 24 hours. What is avoided in this system is the situation where the library is in a rush for the material, and finds out two weeks later that the vendor is "Temporarily Out of Stock"; the library would then be faced with the choice to wait until the jobber receives additional copies or cancel the order and place the order with an alternate vendor.

8.3.4 Book Ordering Interface with Circulation Systems

There is currently an on-line interface between Brodart's OLAS book ordering system and CLSI's circulation system; after the user has placed an order on OLAS using the CLSI circulation terminal, the bibliographic record is automatically converted into the CLSI circulation format and inserted into the on-line CLSI file. The entire process of ordering and adding the record to the CLSI file takes less than two minutes per title.

8.4 RECOMMENDATIONS FOR USE OF ACQUISITION AND BOOK ORDERING SYSTEMS

1. Connecticut libraries should consider the cooperative use of acquisitions systems as they become available; it may be possible to achieve some cost savings as a result of bulk book orders for the same titles ordered at the same time.

2. Cooperative book acquisitions bid packages may provide a larger discount structure from book jobbers (than single library bid packages); automated acquisitions systems may support this type of arrangement.

3. If NELINET decides to offer automated acquisitions, the libraries should consider as part of their decision-making process the fact that the WLN acquisitions and cataloging systems are well integrated; the acquisition data, including any holdings information, is automatically transferred to the catalog files whenever the library is ready to catalog the material. The catalog information is also automatically transferred to the acquisition file if the library wishes to order an additional copy. The WLN acquisition system permits one library to view portions of the in-process record of another library as a way to improve collection development. Commercial vendors, however, do not permit this review of another library's in-process file.

4. Libraries considering an automated acquisitions package addition to their circulation system should perform some form of live benchmark test under full circulation and acquisition load to see if the circulation hardware has sufficient capacity to handle both loads.

5. Libraries considering the installation of a new circulation system should consider acquiring a computer large enough to support both circulation and acquisitions; if this option is selected, a live benchmark test of both transaction loads should be performed.

6. Libraries with future book purchasing bid packages should investigate the approximate costs and benefits of an automated book ordering system; if such a system is determined to be useful, the libraries should include the requirement for an automated book ordering system as part of the bid package.

7. OCLC libraries will have the opportunity to choose the OCLC acquisitions system after a review of the costs and benefits; OCLC may be able to obtain some of the bulk purchase discounts from all book jobbers due to the magnitude of potential library orders from OCLC libraries.

8. Libraries considering automated acquisition systems or book ordering systems should observe these systems in operation at OCLC, CLSI, Dataphase, Brodart, or Baker and Taylor libraries; discussions with actual users will provide an accurate assessment of the systems' actual strengths, weaknesses, costs, user reactions, etc.

9. The relative funding priority for acquisition systems versus other budget areas is the responsibility of the individual library; the cost and benefit tradeoffs must be analyzed for each individual library. Where state funding is available the Automation Coordinating Committee should assist in defining the priorities of acquisition support to specific libraries. It would be desirable, but not mandatory, that the State Colleges and UCONN utilize the same acquisition system with access to each other's in-process files.

Chapter 9

SERIALS SYSTEMS AND SEARCH SERVICES

9.1 SERIALS SYSTEMS

9.1.1 Serials Cataloging

Each of the bibliographic utilities, OCLC, WLN, and RLG/RLIN, support the on-line cataloging of serial titles. OCLC is the host computer for the CONSER project and, therefore, maintains all of the contributed and all of the LC-authenticated CONSER records as part of its on-line files. RLG/RLIN is in the process of developing the software to load the CONSER data base and to build a large joint serial data base of 150-250,000 titles from three large universities (UCLA, Stanford, and UC-Berkeley).

9.1.2 Serials Checkin

OCLC is the only utility which supports serials checkin; no other utility, vendor, or turnkey system available today offers an automated serials checkin service. The OCLC serials system requires the user to key in an acknowledgment of the receipt of the latest issue of a serial and also key in the next expected issue number (Vol 14, No. 6, etc.). At this time, the system does not predict the next expected issue, provide automated binding information, or automatically update the serial holdings statement for each serial title; these changes are in various stages of development.

9.1.3 Union List of Serials (Batch)

Many libraries in Connecticut have placed their serial titles and holdings in one of several union list of serials (ULS) data bases.

These ULS systems are not on-line; rather, they are batch systems which produce either a printed list or a microform file of serial titles and holdings. Although not an on-line system, the use of such a valuable finding tool for serial materials is included in this report due to its importance to good library service in Connecticut. Many special libraries throughout the state have their current serial holdings on these systems; UCONN is using the UMASS (University of Massachusetts) system and has produced a microfiche file of the combined holdings.

Since most of the ULS systems were developed locally, the systems are, naturally, not compatible; the input format used by one library to provide data to its ULS system will not be the same format, and, therefore, unacceptable as input to another ULS system. It may be possible to write programs which will convert the data from one system to another system.

9.1.3.1 Recommendation - Selection of a Statewide ULS System

It would be very useful to have a single large microform file of the combined serial holdings of as many Connecticut libraries as possible. It is recommended that an ad hoc committee of serial librarians review existing ULS systems and select one for use in maintaining a statewide ULS.

There are many serials lists and union list of serials (ULS) programs in use in Connecticut. Two of the major ULS are the statewide ULS operated by the State Library, and the UCONN (UMASS) system described above. The State Library's statewide ULS should be considered the primary candidate since there is a large volume of current data available. The program should be reviewed to determine if it meets the criteria listed below; if not, what is the cost of expanding the program to add the necessary features, compared to the cost of obtaining another ULS system and converting the State Library data?

Regardless of the ULS selected, the State Library should operate the statewide ULS and receive the necessary funding to expand the program to accomodate the new features, add the new library processing load including special libraries, and pay for the necessary file conversion programs to convert other machine readable serials lists to the statewide ULS input format. The Automation Coordinating Committee (see Section 12.1) must decide on the relative funding priority of the ULS program and approve the budget estimate for the expansion of the

statewide ULS. It is beyond the scope of this report to present a cost estimate of this batch system.

The selection criteria should include:

1. The ability to handle a large number of different libraries; the system design should also be able to handle 100,000-200,000 serial titles.

2. A reasonably simple and straightforward input format.

3. A willingness on the part of the system owner to process data from libraries throughout the state.

4. Agreement on prices for input of new data, processing, and distribution of the microform file.

5. Ability of the system to modify the output format and possibly the input format to suit the statewide needs for a ULS.

6. Ability of the system to extract bibliographic and holdings data for a single library or group of libraries to form local, regional, or special discipline ULSs.

7. The amount of data already converted to existing ULS systems; this represents the previous investment of specific libraries.

8. The relative complexity of converting existing data base formats into the input or file format of the selected ULS. This may prove the most expensive cost item in the system; a programmer may have to write a separate conversion program for each existing ULS data base. The cost of these programs could well exceed the cost of recreating the input of some of the smaller ULS data bases to the new ULS system. Even if a conversion program is written, the library is likely to be required to fill in some additional data for each record which the new ULS system requires and was not required nor is available as part of their old ULS system.

It would be possible to produce a statewide ULS which meets the above criteria in 2-3 years; this is a very valuable resource, reasonably inexpensive to produce except for library labor, quite labor intensive (with the library supplying the labor to fill out the input documents), and usable as a finding tool in a large number of Connecticut libraries.

If the Connecticut libraries are willing to contribute to a statewide ULS by purchasing the final product and supporting the input of their titles and holdings, the Automation Coordinating Committee should select a statewide ULS as a high priority for early funding and resources.

9.2 SEARCH SERVICES

The commercial bibliographic search services have been briefly described in Section 3.1.3.3. The purpose of the search services is to discover the existence of pertinent journal articles needed by a library patron. Searching the files of the bibliographic search services is an expensive proposition; the costs vary from $35 to $120 per hour to search. Searching expertise and experience with the particular subject data base is required to obtain the results at the lowest reasonable cost.

Several Connecticut libraries have the required budget and the expertise to search specific search service data bases; law libraries search LEXIS, medical libraries search MEDLINE, science libraries search engineering and physics files, reference departments of larger libraries search more general files such as New York Times, ERIC, etc. It costs a library a considerable amount of time and dollars to train an individual searcher to become familiar with searching in general, and become an expert in a few specific data bases. It can be seen that the larger libraries, and those libraries with patrons in a small number of well-defined disciplines, will tend to be able to justify the expense of such training. This results in an imbalance of service; the patron of a library without the expertise or access to the search services will not discover the existence of the needed material.

9.2.1 Recommendations

The following recommendations will tend to improve or expand the access to the commercial search services.

1. A directory of libraries utilizing search services should be developed and maintained by the State Library.

2. The directory should contain the names of individuals, if possible, and their areas of searching expertise. The directory should contain an index by subject area.

3. A system of bilateral or statewide agreements should be developed which would allow experts to search specific data bases on behalf of patrons of other libraries, with appropriate compensation for the labor and search service charges. The method of allocation could be determined by the Automation Coordinating Committee and would be a function of funding availability.

4. The CLSUs, UCONN, and the State Library should train searching staff in specific, well designated, and minimally overlapped areas. The CLSUs and UCONN should develop expertise in areas required by patrons in their region where the local libraries cannot support the service; by taking advantage of this form of economy of scale, requests for information could be routed from the library to UCONN (academic) or the CLSU (public) for searching.

5. If the CLSUs cannot adequately support this type of service initially, the State Library (for public libraries) and UCONN (for academic libraries) could provide this service until such time as the workload, expertise, and financial base were built up to the point where individual CLSUs could justify the service.

6. Each CLSU, UCONN, and the State Library should own a terminal and an acoustic coupler to be used for searching.

7. Access to the search services is accomplished by dialing special Connecticut telephone numbers in Hartford, Stamford, New Haven, Greenwich, etc., and being automatically connected to the search service computer. The CLSUs within a local calling range of these cities do not have to pay any telephone toll charges to access these special numbers. UCONN and some of the CLSUs are not within a local calling range of one of these numbers and would have to pay toll charges; it is proposed that these CLSUs be compensated for their toll charges to the special numbers, or paid for a "foreign exchange" or extended area line which will eliminate the toll charges, whichever is less.

8. The State Library should provide a higher level economy of scale search service by providing searching expertise on data bases beyond what the CLSUs can reasonably support.

9. When a library staff member needs to be trained in a new search service or new data base, every effort should be made to allow the searcher to observe and practice with an expert in the particular search service or data base; a half or full day trip to observe and practice with an expert will be quickly paid for, considering that inefficiencies and errors cost $35 to $120 per hour.

10. If OCLC provides an on-line connection from its computers in Columbus to the commercial search services, each of the OCLC libraries in Connecticut will have lower cost access to the search services; the OCLC terminals and printers in these libraries would then be usable to search these data bases and the use of the OCLC terminals would then expand to the public service areas. The economic tradeoff compares the possible cost of an additional OCLC terminal, printer, and line cost with the savings in communication costs ($5-$10 per hour) charged by the search services.

11. Terminals acquired for other purposes such as an on-line ordering system may also sometimes be used to access commercial search services; terminals that access RLG/RLIN can always be used to access the commercial search services (and vice versa).

The search services and the statewide union list of serials (ULS) are complementary services; the results of a successful search in a bibliographic search service file show the titles of pertinent journal articles and the journal issues or serial volumes the article appeared in. The ULS, in turn, shows which libraries in Connecticut have the particular issue or volume containing the pertinent article; the ULS is used to locate the material if the patron's own library does not have the required journal issue or serial volume. Without the statewide ULS, a successful on-line search on the search service files could result in a time consuming and costly manual search by telephone or mail to locate a library with the proper material.

Chapter 10

ADDITIONAL RECOMMENDATIONS

This chapter describes a series of general recommendations which are not specific to a particular automated system or form of automation such as circulation or cataloging, and have not been described in other sections of this report. The recommendations are grouped according to the organization which would most likely be responsible for implementing the recommendations.

10.1 STATE COLLEGES

The State College libraries have very little automation and essentially no budget for any form of automation. The following recommendations are offered in order to permit the libraries to participate in sharing their resources with other Connecticut libraries, and in being able to utilize the resources of other libraries. Libraries in general cannot afford to purchase all of the material required of its patrons; what is needed is the ability to accurately, quickly, and inexpensively locate materials in other libraries.

1. The State College Board of Trustees should establish a special fund or budget to be used for library automation at the State Colleges. It is imperative that this funding be obtained as soon as possible in order for the State College libraries to begin taking advantage of automated cataloging, circulation, COM catalogs, and retrospective conversion. Until each of the State College libraries has completed conversion, the other libraries in the state (public, academic, and the University) have no means of easily locating material at the State College libraries. Although the amount of unique material held in the State College libraries is unknown at this time, it is reasonable to assume that approximately 10-15% of the titles represent the only copy of that title in Connecticut.

2. The budget should include the acquisition of

a) OCLC terminals, as well as training and startup costs, to permit the colleges to obtain cataloging data, catalog cards, and perform statewide (and out-of-state) interlibrary lending. Joining OCLC will also permit the libraries to automatically contribute copies of their bibliographic records to the statewide data base.

COST ESTIMATE: $5000 per library

b) Microfilm readers and microfilm files such as the proposed Statewide Union List of Serials (ULS), and the proposed UCONN, academic, or statewide data base on microfilm.

c) Selectric typewriters (where none are available) to permit the input in Optical Character Recognition (OCR) form when a project requires such input.

d) Computer terminals to access the commercial search services for locating the existence of journal articles required by the library's patrons; these same terminals can access RLG/RLIN to provide cataloging information, and eventually UCONN to provide location, bibliographic data, and interlibrary loan data from UCONN's main collection.

e) Staff support (labor dollars) to provide the input necessary to support OCLC cataloging, retrospective conversion, the union list of serials, and other statewide projects.

f) As soon as possible after the installation of the OCLC terminals and training of library staff, the State College libraries should obtain additional funding for staff to perform retrospective conversion. This data is required for the statewide data base, a possible State College union catalog, and an automated circulation system title and holdings file for the circulation systems which will eventually be installed in (or for) the state colleges.

g) As an alternative to the point above, if it is not possible for the State Colleges to join OCLC, the UCONN library could perform the processing center functions for the State Colleges.

h) If the State College libraries have a major book purchase contract with a vendor that offers acquisition tapes (full bibliographic records for each title the library acquires) the libraries should begin to order these tapes as soon as possible. These tapes can be used for the statewide data base and can be used for a future conversion to a campus, State College, statewide academic, or statewide microform file, or circulation file.

i) The State Colleges should investigate the feasibility and costs of participating in either a statewide academic or a regional multitype automated library circulation system. In the first option the 4 state colleges would share a single circulation system; each library would have circulation terminals in their respective libraries and telephone lines extending from the location of the central computer (probably in one of the libraries) to each of the other libraries. In the second option each campus would join a regional circulation system housed at a public library, a state college, UCONN, or a CLSU. It would be a more effective use of labor and hardware budgets to join OCLC first, then perform retrospective conversion on OCLC, and, finally, obtain an automated circulation system (using the retrospective conversion file as the basis of the circulation file).

10.2 STATE LIBRARY

There are recommendations for State Library action throughout this report; coordination of the statewide data base, develop expertise in specific search services and data bases, and operation of a clearing house for circulation RFPs are examples of these recommended actions. Following are additional recommendations for State Library action:

1. The State Library should hire one or two senior library consultants, and train some existing staff in different areas of automation such as circulation systems (planning, selection, budgeting, and operation), union list of serials (local, regional, and statewide), acquisition, microfilm, and cataloging systems, etc. These automation consultants would be used to assist Connecticut libraries and consortium in planning and acquiring various types of automated systems. In

order to train the staff, there needs to be both an in-state and out-of-state travel budget. The staff should visit current user installations of various systems, establish good contacts with these users for future information needs, visit vendor exhibits at conferences such as the American Library Association, American Society for Information Science, state library conferences, special library associations, etc. The State Library automation consultants should work as part of a team with libraries acquiring and installing new systems; the consultants would learn the details of systems acquisition and installation, and be in a position to document their experiences and assist the next group of libraries. In this manner some of the difficulties may be avoided, many of the cost saving ideas and procedures will be passed along, and the future installations will be less costly in terms of dollars and hours.

2. The automation consultants should assist a library considering a circulation system by suggesting good sample RFPs from the clearinghouse, reviewing the library's draft RFP for omissions and suggestions, reviewing the vendor proposals to point out potential problems, inconsistencies, and cost and performance implications.

3. The automation consultants could assist in the planning for conversion to a circulation file, a microfilm catalog, or a variety of other services by providing alternatives, approximate costs, suitable vendors, and previous user experiences and contracts.

4. The State Library should begin to allocate LSCA funds and State funds to projects supporting statewide goals such as the generation of input for, or data base conversion to, the statewide data base and microform catalog.

5. The State Library should support the conversion of key data bases such as the UCONN circulation file and the CLSI circulation files.

6. The State Library should take the lead in coordinating the statewide data base project. Included as part of this project are:

   a) The establishment of a permanent, formal Statewide Data Base Task Force.

b) The definition of a work plan and requirements for statewide efforts.

c) The selection of a COM and conversion vendor.

d) The upgrade as necessary to full MARC bibliographic records and the merging of various data base tapes including:

   i) OCLC Cataloging Tapes (from NELINET)

   ii) UCONN Circulation tapes

   iii) CLSI Circulation tapes

   iv) Acquisition tapes from all libraries

   v) The State Library OCR records

   vi) Other data bases as available

e) The generation of a test COM microfilm and microfiche catalog.

f) The generation and distribution of the statewide COM catalog(s).

g) Financial support to certain libraries for the acquisition of the statewide COM catalog and microfilm readers.

h) The generation of revised interlibrary loan procedures based upon use of the Connecticut COM catalog.

i) The establishment of procedures for individual libraries to add new titles and holdings to the statewide data base including libraries without any automation, data bases, or terminals. Investigate the use of typing input on Selectric typewriters with an OCR type font.

j) The development of a preliminary priority list for retrospective conversion of other non-converted collections. The priority list should consider collection size (largest first?), collection uniqueness (only copies), availability of staff and space to support conversion, highly requested ILL material, etc.

7. Once the statewide data base is established and the COM catalogs distributed, the State Library should consider placing the service center material in those libraries with sufficient space to house small portions of these collections. Since the future dispersed locations of all the current service center material would be available on the statewide COM catalog, access is assured; usage of some of this material may actually increase due to the availability of the bibliographic and location information on the COM catalog. The extra space made available by this move could be used for other purposes or the extra rent reduced proportionately.

8. The interlibrary loan operations at the State Library should be redirected to coordinate and build up the statewide data base and the generation of the COM catalog. The combination of the OCLC ILL system and the statewide COM catalog should improve statewide ILL dramatically. The State Library ILL operation should operate the service for those libraries who do not have access to OCLC or the COM catalog. Libraries with either or both finding tools should be encouraged to borrow directly from the holding library.

9. An interlibrary loan committee should be established or given an additional charter to consider procedural changes in locating, requesting, borrowing, delivery, and reimbursement due to the future availability of the statewide COM catalog, and the nationwide OCLC files.

10. The State Library should begin a cost/benefit study and write a Request for Proposal (RFP) for a commercial automated circulation system to be installed in the State Library. This system could be used for circulation, statewide ILL of State Library materials, and inventory control purposes. Once a preliminary estimate of cost has been obtained, the funding for this system should be obtained as soon as possible.

11. The State Library should consider the purchase of a sophisticated word processing system. This system should be used as a small computer to maintain current statewide standards and specifications, funding and grant information, special lists, RFPs, etc., as well as for secretarial purposes.

10.3 UCONN

Many recommendations for UCONN actions were described in earlier sections of this report, including conversion of the UCONN circulation book cards to full bibliographic records and the use of the book card and later the full bibliographic records in the SPIRES system to provide limited patron searching of an on-line catalog. Additional recommendations for UCONN to consider are:

1. The University library should act as a coordinator (and developer) for automated services for the university, regional, and other academic libraries.

2. The University library should perform such services as searching bibliographic data bases (Lockheed, SDC, New York Times, RLG/RLIN, etc.) on behalf of the State College libraries until they have acquired search terminals and the expertise required to perform their own searching.

10.4 CLSUS

The CLSUs play an important role in library resource sharing in Connecticut. By taking the part of a broker the CLSUs can bring services to the smaller libraries in the region which the smaller libraries could not afford on their own. The CLSUs can take advantage of certain economies of scale, by purchasing an automated circulation control system which can be shared by its members, by hiring and training data base searchers, by providing OCLC processing center services for some of its members, etc.

The principle automated activity currently being planned by two CLSUs is the acquisition of an automated circulation control system for use by their member libraries. One very strong recommendation is that the CLSUs closely adhere to the recommended principles for acquiring these systems as outlined in Chapter 6. Unless the CLSUs accurately determine the member libraries' transaction load and test this load during a live benchmark test, there will be a high likelihood that the delivered system will run out of capacity before all of the libraries have been installed on the system. This will increase the unit cost of operating the system for the installed libraries. If this potential capacity problem is acceptable to the membership, and has been integrated into

the plans, then live full-load benchmark testing may be omitted from the implementation plans.

10.5 ALL LIBRARIES

The proliferation of microcomputers in our society will affect activities in libraries. The installation of public access microcomputers for personal use or instructional purposes is not related to the concerns of this report, but microcomputers will also begin to be used in internal library operations. They will operate in an off-line mode and will be used either for small, self-contained operations not requiring large files or to interface with other automated operations. These microcomputers are simple to program and inexpensive to obtain and are beginning to be used by libraries across the country to meet immediate needs. Exchanges of programs between libraries using similar hardware will be on an informal basis. Libraries should encourage experimentation in this area, particularly as the use of home computers expands.

PART IV

1980-1985: A FIVE YEAR PLAN

Chapter 11

INTRODUCTION TO THE PLAN

This chapter defines a time table for automation activities in Connecticut libraries. All of the activities described in this five year plan have been defined in greater detail in previous sections of this report. The dates selected are somewhat difficult to achieve; the activities will consume staff time from the State Library, public and academic libraries, CLSUs, and UCONN. The schedule indicates the fiscal year the activity could take place. For major tasks which span multiple years, the beginning and ending dates are indicated.

The time period from 1980 to 1985 is meant to include the period from July 1980 to June 1985, or some other appropriate fiscal year. Although the fiscal year (FY) 1980/1981 will begin in July 1980, it is expected that this report will be reviewed and approved early enough in calendar 1980 for certain activities to be initiated in fiscal 1981.

11.1 THE SYSTEM DEVELOPMENT PROCESS

Each of these tasks will evolve through a system development cycle which will be refined by the statewide committee responsible for coordinating the automation activities. In general, the system development cycle will consist of a series of steps or subtasks.

1. The first step is a general definition of the task: this definition includes a description of what is to be accomplished by the task (such as: Generate and Distribute the COM Statewide Catalog), who will be assigned to the task team, when the task is scheduled for completion, and a rough estimate of the staff time involved. The first few estimates will be quite a bit lower than actual time spent on the tasks; with experience, the accuracy of these estimates will improve.

2. The next step is a detailed definition of the task. The ad hoc task team must now be assembled; staff from the various libraries and CLSUs are assigned and the planning meetings begin. The team must now define in detail all of the subtasks which must be accomplished in order to complete the task. As an example, for the above task, the detailed definition of the subtasks would include:

   a) Determine number of machine readable records available

   b) Determine sources and formats of available records.

   c) Determine conversion and upgrade requirements

   d) Assemble information and generate RFP

   e) Submit RFP to vendors

   f) Evaluate proposals

   g) Select vendor

   h) Conduct benchmark tests from OCLC, CLSI, and UCONN circulation records

   i) Evaluate and select final COM output format

   j) Determine number of copies of the COM catalog required and price per copy

   k) Secure funding for COM vendor and COM readers

   l) Submit all OCLC, CLSI, and UCONN tapes to the vendor

   m) Vendor to produce the COM master and multiple copies

   n) Distribute the statewide COM catalog

3. The next step should be a review and approval of the detailed definition document. In the example above, approval means to proceed with the task.

4. Each of the subtasks would be conducted in turn. In this example, the next major review points would likely be review and approval of the RFP, review and approval of the vendor

selection, and review and approval of the price per copy of the COM catalog. The coordinating committee would also be required to determine the funding and staff priority of this project relative to the priority of the other projects.

11.2 A NOTE ABOUT SCHEDULES

The schedules in this chapter are approximate. The completion of many of the tasks require a considerable amount of coordination, definition, and actual implementation activities. The more organizations and individuals involved on a task team the longer it will tend to take (providing there is a critical mass to begin with). Things take longer than expected and there are always surprises. A major part of each task is the task definition; one of the most critical events which must occur during the task definition is the assimilation of experiences and values of each of the team members by the other team members. This normal process takes time and helps assure an adequate and acceptable solution.

The time each task will take is a function of the number of staff assigned (not enough, enough, or too many), the amount of time spent on the task, the relative priority placed on the task by the organizations and the individuals, and the support received from other organizations (requests to review a position paper, response from a vendor for details and costs, etc.)

The schedules presented in this chapter are to some extent optimistic; they assume a willingness on the part of each organization to participate in certain tasks, a willingness to use local staff and financial resources to produce statewide systems which will allow Connecticut libraries to begin to optimize globally rather than locally, and a willingness to modify local procedures in order to adopt statewide and national standards and practices. The schedules also assume that minimum effort will be spent in local political jurisdictional differences. Most important of all, the schedule assumes the organizations involved in the initial organizing, coordinating and planning will begin activities quickly and participate heavily; the main bottleneck in this five year plan is getting organized and getting started.

If funding and staff are available sooner than these schedules indicate, by all means begin the projects sooner.

Chapter 12

TASKS FOR 1980/81

12.1 AUTOMATION COORDINATING COMMITTEE

1. Form an Automation Coordinating Committee (ACC) with representative membership from various types of libraries, regions, and agencies; the ACC (or other more suitable name) will be a formal advisory committee responsible for reviewing and advising on statewide automation projects. Major responsibilities would include:

   a) Establishment of statewide priorities for automation projects, including circulation, retrospective conversion, statewide data base, ULS, etc.

   b) Definition, approval, and implementation of standards for statewide bibliographic control, resource sharing, data base, and COM catalogs.

   c) Approval of general and detailed task definitions.

   d) Approval of major subtask documents and subtask milestones.

   e) Preliminary assignment of task team coordinator and team members; final approval of staff availability must be obtained from each of the organizations involved in the task.

   f) Preliminary allocation of automation funds; final recommendations must be obtained by the LSCA Board and final approval obtained from the State Library.

2. Establish a Statewide Data Base Project and Task Force; this project reports to the ACC and will coordinate, define, and direct the activities necessary to establish the Connecticut statewide data base; in addition to the task force members,

the task team coordinator and most of the staff support should come from the State Library and technical support from UCONN. Membership should include public libraries, CLSUs, UCONN, State Colleges, and the State Library. The task force should plan for the generation of a COM catalog as the first product from the statewide data base. A target of 1982/83 for the first release of the COM catalog, with a minimum of 500,000 titles, should be established. A target of 1980/81 (or early 1981/82) for selection of a COM vendor is a reasonable milestone for the task force.

3. Establish a Union List of Serials (ULS) Project and Task Force; this project will coordinate, define, and direct the establishment of a statewide ULS data base and COM catalog. The task team coordinator should be from the State Library or UCONN.

4. Establish a Bibliographic Standards Task Force for the Statewide Data Base; this task force could report to the ACC or the Statewide Data Base Task Force and would be responsible for development of statewide standards for the data base. Membership should include a representative from Yale; Yale is a member of the RLG/RLIN counterpart of this committee and has considerable experience in this area. The task force should generate decisions regarding:

   a) AACR2

   b) Authority files; permission for the COM vendor to automatically change headings in the data base when LC revises the heading, etc.

   c) Best record replacement rules for duplicate records on data base

   d) Method of recording holdings data (call number, library code, copy, and location)

   e) Retrospective conversion standards and practices

   f) Recommendations for a priority list for retrospective conversion based on bibliographic considerations

5. Establish an ILL Standards Task Force; this task force will develop rules, procedures, and priorities for in-state and

out-of-state ILL activities once the statewide data base is available on COM. This task force should generate a priority list for retrospective conversion based on present ILL patterns and collection uniqueness.

12.2 STATE LIBRARY

1. Help form and publicize the ACC; secure initial funding for the ACC.

2. Begin the clearinghouse for circulation RFPs.

3. Hire one or two new staff and reassign some existing staff to become automation consultants; this staff should work with the CLSUs and other libraries in their circulation contracts and installation efforts. This staff should also assist the other automation task forces.

4. Begin the funding steps necessary to secure funding for:

   a) Acquisition tapes from book jobbers for all Connecticut libraries utilizing these book jobbers. Although some vendors retain a limited number of retrospective records, it is important to begin receiving the tapes immediately so that as much data as possible may be captured. These machine readable records are inexpensive (less than $0.15 per title ordered, with possible quantity discounts) and are in MARC format and compatible with future uses such as the creation of a statewide data base. These archival records are as important and useful as OCLC records, especially for smaller libraries which do not have OCLC and which tend to purchase a high percentage of their books from a major book jobber offering this service. It is, in most cases, impossible to obtain these machine readable records if these records are not requested at the time the books are ordered.

   b) UCONN book card tape conversion to full MARC bibliographic records; for 1980/81 attempt to fund a test sample conversion.

c) CLSI to full bibliographic records; for 1980/81 attempt to fund a test sample conversion.

5. Open an RLG/RLIN search only account and learn RLG/RLIN search capabilities; determine the strengths and weaknesses of the system (and files) and determine the potential market for such services among public libraries in Connecticut.

12.3 UCONN

1. Generate a magnetic tape from the circulation book cards; eliminate duplicate titles and merge the holdings. Some of these book card records already appear on certain magnetic tapes as a result of normal circulation activity. If a method can be found to determine in advance which book cards already appear on magnetic tape, these book cards need not be handled again. In order to generate a magnetic tape from the book cards, the cards need to be removed, processed through a card reader, and replaced in the books; this is a very labor-intensive operation (approximately 3-5 manyears) and a one-time budget appropriation will be necessary.

2. Submit a copy of the complete tape to the State Library along with a sample tape of 1,000-2,000 records (0.1 - 0.2% sample). The sample tape will be submitted to a COM vendor to test the vendor's matching algorithms and bibliographic resource files; the full tape will later be sent to the COM vendor for a full conversion. Retain copies of the sample and complete tapes; they will be used for the SPIRES application described below.

3. If confirmed by a cost/benefit analysis, generate an on-line catalog for limited reference and patron searching, utilizing the SPIRES system on the UCONN computer and the information from the existing book cards.

   a) Generate a SPIRES file definition for the book card records.

   b) Test the system using the sample file and the existing library terminals.

c) Expand the UCONN computing facilities to handle the increased file size (500,000 - 1,000,000 records plus indexes).

d) Load the complete UCONN tape.

e) Train reference staff and patrons in the use of the system.

f) If the searching capability is successful and useful, expand the port capacity of the UCONN computer and add more terminals and lines in the library and around the campus.

g) Begin planning for dial-up capability to the UCONN file to allow other Connecticut libraries to access the file.

4. Develop a Request for Proposal (RFP) for a commercial circulation system and obtain the necessary budget to obtain the system at the earliest possible time. If it has not been accomplished as part of the statewide data base effort, be sure to include funding for the labor necessary to convert the punched cards to magnetic tape (extracting and replacing 1,000,000 book cards, bringing the books to the reader, etc.) and the vendor charges for upgrading the 80 character records to full MARC records.

5. Open an RLG/RLIN search only account to train staff and access the RLG/RLIN files, including the new Yale and other research library cataloging activity. Evaluate the benefits and costs for UCONN cataloging and ILL activity; evaluate the benefits and costs of extending the service to other academic and regional libraries. It is expected that 10% - 20% of the current cataloging titles not found on the OCLC files (non-hits) can be obtained from the RLG/RLIN files.

6. Assist the State Library to coordinate the statewide ULS task force; define the goals, suggested membership, and approximate time table.

7. Investigate the utility of ordering acquisition tapes for all UCONN titles, or for the portion not cataloged through OCLC. If feasible, and funded, order acquisitions tapes.

8. Determine the need for regional or academic search service support; conduct experimental searches for other academic or regional libraries.

12.4 PUBLIC LIBRARIES AND CLSUS

1. Submit circulation RFPs to State Library clearing house.

2. CLSUs should investigate the costs and benefits of obtaining a shared (network) circulation system for their respective regions. If such a system can be supported, the CLSU should proceed to obtain the initial funding, write the RFP (Request for Proposal), and carefully follow the outline for acquiring a commercial system as described in Chapter 6.

3. Continue to acquire and install circulation systems as planned. Perform live full-load benchmark and acceptance testing prior to initial operation of circulation system. Work with State Library automation consultants in order to transfer the experiences to other libraries and CLSUs.

4. Insure that the Library of Congress Card Number (LCCN) is included in all circulation records; this will be required for later matching and conversion of the record to full bibliographic records and inclusion in the statewide data base. All non-automated libraries should insure that LCCNs are included on shelf lists or similar records.

5. Submit copies of CLSI tapes to the State Library; these tapes will be sent to a COM vendor to test the vendor's matching software and bibliographic resource files.

6. Establish a Circulation Systems Standards Group. This group would establish formal or informal standards and procedures to assist in the selection, installation, file conversion, and operation of circulation systems in Connecticut. The sum of knowledge and experiences of the operators of current systems can be utilized to reduce the time, costs, and efforts of the libraries planning to install new systems. The group coordinator should be an operator of a existing system. The group should determine the most effective ways of serving their patrons in a multi-library and multi-type library environment. The group should review the differences between different vendor systems installed or being installed in Connecticut and formulate procedures and standards which will minimize these differences. Connecticut will soon have circulation systems from different vendors installed in different libraries; one of the tasks for this group is to

determine the best method of interfacing these systems. The experiences in Illinois and Clark County, Nevada should be reviewed as examples of multi-library and multi-type library (academic and public) cooperation.

7. At least one library in each region should be a member of OCLC to provide cataloging services to other libraries in the region by performing a processing center function. It may also be possible to support ILL services on behalf of other libraries in the processing center. A public (or CLSU or academic) library should apply for funding from the home institution or from an LSCA grant during 1980/81.

8. Libraries in the various regions should determine the need for regional services such as OCLC processing center, regional search services, a regional catalog as an ILL finding tool, and a regional circulation system.

9. OCLC libraries that do not perform all of their cataloging on OCLC, and non-OCLC libraries, should order acquisition tapes if their libraries have a book purchase contract with a vendor that supplies acquisition tapes.

10. CLSUs should also investigate the costs and benefits of obtaining a shared expanded on-line order system from a book jobber. To maximize the benefits the users of the shared system should agree to purchase most of their materials from that book jobber.

12.5 STATE COLLEGES

1. The State Colleges should determine what form of automation has the highest priority and submit a combined budget request for the 1981/82 budget cycle.

2. State College library staff should visit Connecticut libraries that utilize different forms of automation to review the various benefits, costs, and operational experiences. The information gathered during these visits, plus visits to the American Library Association, New England, and New York Library Association exhibits, should provide the background required to create a realistic budget request.

12.6 OTHER AGENCIES

1. NELINET should extract the Connecticut records from the OCLC tapes and submit these records to the State Library.

2. NELINET should extract Connecticut archival records from the OCLC archive tapes as they are received from OCLC, and submit these records to the State Library.

Chapter 13

TASKS FOR 1981/82

13.1 AUTOMATION COORDINATING COMMITTEE

1. The ACC will continue to review and approve subtask milestones submitted by the various project task forces; this is an ongoing task for the full five year time frame and will not be repeated in this report.

2. The ACC will continue to revise the automation priority lists.

3. The ACC should establish a cost reimbursement component to the ILL Standards Task Force or establish a new task force to determine methods of measuring ILL support by individual libraries, methods of reimbursements for net lenders, etc.

4. The ACC should establish an On-line Catalog Review Task Force. This task force will be responsible for defining the requirements of an on-line catalog and review of any vendor systems or potential systems. The task force should review and evaluate the UCONN SPIRES experiences as an example of a locally-developed on-line catalog in a shared computer environment.

5. The ACC or a separate task force should continue developing plans and priorities for retrospective conversion projects. OCLC libraries should use OCLC for retrospective conversion. A review of conversion alternatives for non-OCLC libraries should include hardware required, speed of conversion measured in titles per staff hour, unit cost of the various conversion methods and vendors, and an estimate of the cost of several typical conversion projects. Given the unit cost information, it should be possible to estimate the total project costs of each conversion project. These projects should then be broken down into multiple year projects at various libraries and funding sought for the top priority projects.

6. Review the cost and benefit tradeoffs for UCONN's acquisition of a commercial circulation system, and recommend whether or not UCONN should obtain a system for its own use or for a shared (network) use by regional or academic libraries.

13.2 STATE LIBRARY

1. The State Library should secure incremental funding for the statewide data base, the COM catalog, the task team expenses, and the complete tape conversion of the CLSI and UCONN tapes. If the complete funding is not available in 1981/82, a priority must be established and as much tape conversion as possible be accomplished in 1981/82.

2. Based on the test tape conversions, the State Library should work with the COM vendor to generate some sample COM catalogs for study by the Statewide Data Base and ILL Task Forces.

3. Based on the results of the retrospective conversion alternatives and costs study described above, begin planning for the conversion of the manual portion of the Connecticut Union Catalog.

4. Begin the study to determine the feasibility of dispersing the service center collections to libraries throughout the state.

13.3 UCONN

1. If the SPIRES on-line catalog is providing a beneficial service to UCONN patrons and an additional transaction load can be accomodated without exceeding the computer capacity, expand the computer facility to add dialup ports to the UCONN computer which will allow libraries throughout Connecticut to access the UCONN bibliographic file. The SPIRES system will allow more versatile searching for difficult titles than will the statewide COM catalog.

2. Train two or three other libraries in the SPIRES searching strategy; provide a six month evaluation period to determine

costs and benefits of on-line access to the UCONN files by other libraries.

3. Submit the Request for Proposal for a circulation system to bid, select a vendor, install the system, produce the converted title, holdings, and patron files, and begin operation of the new system.

4. Provide support to the ULS study.

5. Based on the successful results of a cost/benefit analysis, expand or revise the SPIRES file definition to accommodate the full bibliographic record; contact Yale and RLG/RLIN to determine availability of SPIRES bibliographic file definitions. Load test tapes from the vendor's UCONN book card conversion. Test the new subject, added author, full title, LCCN, ISBN, series title, LC call number, Dewey call number, publisher, and publication date indexes, etc.

6. As the result of the above test evaluation of the new indexes, revise the SPIRES file definition to delete the unnecessary indexes. If the COM vendor has produced all or part of the conversion of UCONN tapes to full bibliographic records, begin loading these records into the SPIRES system using the revised file definition. This process of loading 500,000 to 1,000,000 records will take many months due to the computer time (approximately 0.1 second per record) and disk accesses (approximately 20-40 accesses, or 2 to 4 seconds elapsed time per record) required to process each new record (add the record to the bibliographic file and the indexes to the index file). Since the computer is used for many other purposes, the loading of the UCONN file will likely have a lower or background priority; the 500 to 1000 hours of elapsed time required for disk accesses will take several months, perhaps years, to load the entire file. The library must negotiate the priority, schedule, and costs with the computing center.

7. The UCONN computing center will be evaluating the new series of IBM and IBM compatible vendor announcements made in 1980 and 1981. In the event the computing center chooses to obtain one of these new computers (which will be much more powerful than today's computers and much less expensive), the library and the computing center should seriously consider the costs, benefits, installations, and operational aspects of installing the WLN system at UCONN.

13.4 PUBLIC LIBRARIES AND CLSUS

1. If the 1980/81 studies have shown a need for regional OCLC processing centers, they should be implemented in 1981/82; regional cataloging and ILL services should be available in late 1981/82 (or 1982/83).

2. The results and experiences of several months of operation of multi-library, multi-type library circulation systems should be documented, by the operators of the system and the State Library automation consultants, as a guide to other organizations contemplating a similar move. The results of the live full-load benchmark and acceptance tests should be made available to the State Library, and through the State Library to other libraries in Connecticut and the country.

3. Begin planning for the interface of the new circulation systems with the current CLSI systems. Define the interface requirements and request a cost and schedule estimate from both vendors.

4. Review the need for regional search service "experts" and, if required, select the search services and data bases, and begin the training.

5. Determine the need for a regional COM catalog containing bibliographic and holdings data for all libraries in the region; the data for the COM catalog would be extracted from the statewide data base. Submit this information to the statewide data base and ILL task forces.

6. Determine the need for a regional ULS COM catalog; the process described above applies here also.

7. If the vendors of CLSI or any new circulation systems installed in Connecticut libraries have implemented an acquisition service, one of the libraries with an existing circulation system should investigate the new system and report the findings to other libraries. The first step is to contact current users of the new service to determine the incremental hardware, software, and staff costs, the implementation and training experiences, and the users evaluation of the service. If the results of this survey are positive, the library should implement the system (without

adding additional hardware, if possible) and operate on a test and evaluation basis.

13.5 STATE COLLEGES

1. The State Colleges should join OCLC and purchase the terminals, Selectric typewriters, or other hardware justified in their 1980/81 budget requests. Libraries with computer terminals should begin training for OCLC and begin current cataloging activities. As soon as possible after current cataloging is underway, the libraries should establish retrospective conversion projects. Libraries with Selectrics should begin keying input for the statewide ULS or the retrospective conversion project.

2. The State Colleges should investigate a regional or academic circulation system; in many cases it will be less expensive for some of the State College libraries to join an existing or planned regional circulation system than to justify an academic circulation system with its high purchase cost of hardware and relatively high cost of communication lines between campuses.

3. The State Colleges should plan for the next step in automation. Again, each library may have different priorities or they may present a common statewide plan for automation. Contributions to the statewide data base and ULS data base should have a high priority since the library material will be more heavily used by other campuses and other Connecticut patrons when the material is represented in the COM catalogs. Since the first distribution of the statewide COM catalog is scheduled for 1982/83, the libraries should determine the costs of the COM catalog and COM reader alternatives (fiche and film) and determine the preferred option. Once the option is selected and the number of copies determined, the budget amount should be submitted for 1981/82 (or 1982/83 if the COM catalogs will be delivered late in the calendar year).

Chapter 14

TASKS FOR 1982/83

14.1 AUTOMATION COORDINATING COMMITTEE

1. The ACC should review and approve the ILL cost reimbursement report and begin steps to implement the system. The record keeping forms for statistics should be produced and distributed; the budgetary support should be requested; the State Library should coordinate this effort.

2. The retrospective conversion report should be reviewed; of the several options for retrospective conversion a few methods should be selected (i.e., OCR input by Selectric typewriter, home or micro-computer terminal with disks, OCLC, on-line standalone conversion on a circulation computer, etc.). Conversion projects should be assigned for 1982/83 startup. In some cases it may be less expensive to pay for a specific library to join OCLC and have the project pay for the terminals and the first few years of current cataloging costs in order to get "free" retrospective conversion services for a library with a unique collection.

3. The ACC should establish a Network and Technology Task Force; this task force would be responsible for reviewing the state of the art in terminal and communications technology as well as the national network activities. Areas to review include: home and micro-computer terminals, retrospective conversion technology, satellite communication for industry and the home, teletext (Viewdata/Prestel), facsimile transmission, national network line and message protocols, linking between utilities such as OCLC and RLG/RLIN or LC, linking of utilities and other search services such as OCLC with search services, circulation systems, and any other form of technology which may affect automation in libraries.

14.2 STATE LIBRARY

1. The State Library should secure annual finding support for task teams, retrospective conversion, production of the COM catalog, the ULS catalog, and regional/statewide search service coverage.

2. The first release of the statewide COM catalog should be in 1982/83.

3. The vendor costs and prices to charge for regional and individual library COM catalogs should be determined. If there is enough of a market for one or more regional catalogs or individual library catalogs, order these COM catalogs from the vendor.

4. Coordinate with the vendor, and libraries beginning retrospective conversion for generation of circulation system files, to have the vendor generate circulation file records from the statewide data base.

5. Working with the Bibliographic Standards Task Force, determine the use of national authority files with statewide exceptions for the statewide COM catalog. If it is decided to implement a statewide authority system, have the vendor modify and update the statewide data base prior to the next release of the COM catalog.

6. Complete conversion of the manual Connecticut Union Catalog; after these records are added to the statewide data base and appear on the COM catalog, all ILL searching should occur on OCLC or the COM catalog. The cost of maintaining the manual union catalog should be eliminated.

14.3 UCONN

1. Review the state of the art of on-line catalogs. This is a study that should be repeated every two years, the next time in 1984/85. When a vendor's product becomes available, investigate the conversion, installation, hardware, facilities, and training costs. If UCONN, State Library, or

LSCA funding is available, produce an RFP, select a vendor system, conduct benchmark and installation tests, and install the system. If funding is not available for an installation at UCONN, but is available for a public library installation, UCONN should assist in the planning, testing, and evaluation of the system.

2. Begin the retrospective conversion of those parts of the UCONN collection not converted from book cards and likely to be unique within Connecticut libraries. This conversion project may take several years. During the following years the state of the art and available options for retrospective conversion will change; UCONN should review these options and, if and when it becomes appropriate, change to the new methods.

14.4 PUBLIC LIBRARIES AND CLSUS

1. Continue selected retrospective conversion according to the statewide conversion priorities and funding availability.

2. Install the CLSI to new circulation system interfaces, if available from the vendors, and begin transmitting on-line ILL transactions between different vendors' systems.

3. Market the regional COM catalogs. Determine the new ILL patterns due to regional COM catalogs.

14.5 STATE COLLEGES

1. Continue selected retrospective conversion projects according to the statewide conversion priorities and funding availability.

2. It may be possible for several colleges to share some retrospective conversion hardware such as computer terminals, especially the home or micro-computer type terminal with mini-disks. These terminals will cost in the $500 to $1500 range in a few years; they may be purchased by the State College system and loaned to a specific library for the period of the

retrospective conversion project, then loaned to the next campus, etc. It may be possible to rent these terminals from the COM vendor. A third alternative might be for the State Library to purchase a few of these terminals as floater terminals and loan them to the libraries according to the retrospective conversion priority list.

3. The State Colleges should continue the funding requests for retrospective conversion until the projects are complete at each campus; these projects will take several years to complete.

Chapter 15

TASKS FOR 1983/84 AND 1984/85

The tasks for 1983/84 and 1984/85 are primarily a continuation of tasks begun in previous years. The Automation Coordinating Committee will continue to review and approve subtask milestones, advise the State Library on priorities, and establish new projects as required. There will be continual feedback from various projects; some of the findings and reports will suggest new activities to explore, new services to provide patrons, and a general lowering of the unit cost of some processes. Some projects will run into difficulties which will cause these projects to slip schedules into the 1983/1984 and 1984/85 periods; this is expected, since the projects have not yet been fully defined, the funding is not secure, etc.

The statewide data base is an on-going project; funding must be available to continue the addition of new titles and holdings to the data base and the production of a statewide (and perhaps some regional or discipline) COM catalog. Over time, the statewide data base will be used to generate circulation records and on-line catalogs for individual libraries or groups of libraries.

> COST ESTIMATE: $150,000 per year (partially or fully reimbursed by libraries paying for copies of the COM catalog)

15.1 THE EMERGING FUTURE OF TECHNOLOGY

New vendors and new automation products will continually appear; existing products and services will change in character, functions, and costs. As new technology appears, vendors will absorb the relevant portions in their new products. As the national library network emerges during the 1980s, libraries will be able to take advantage of the new services, first through utilities, later from network brokers and commercial vendors, and finally through the libraries themselves.

In general, computers and file storage are becoming more powerful and less expensive every year. By 1985 it will be possible for a network broker (such as NELINET) and perhaps a regional consortium to own a computer more powerful than the present computers at the cataloging utilities. The technology and the costs will eventually permit a powerful and relatively inexpensive standalone computer in the library to perform acquisitions, cataloging, circulation, patron and library staff searching, as well as word processing, message switching, electronic conferencing, and special report generation.

Some of this will occur before 1985; these early systems will be marketed and a few pioneering libraries will be using some of these services by 1985. By 1990 these systems will be the norm rather than the exception.

15.2 THE LIBRARY RESPONSIBILITY

It is possible for Connecticut libraries to take advantage of this technology. The ACC and task forces can bring the information to the attention of administrative boards, trustees, presidents, etc. It is up to the various libraries to justify the expenses of automation in order to achieve the results of better service to patrons and provide lower unit costs in some areas.

The United Staes is one of several industrial countries emerging into an information age. Computers and information systems will be a powerful and complex part of our society. During 1985-1990 there will be more powerful information services available in the home than are available today in any library; the use of teletext and home computers will bring personally selected portions of vast information files into the home electronically.

Libraries must be prepared to provide services in this environment or face continually reduced usage. Academic libraries have a responsibility to prepare the students for this environment as part of the academic resources of the institution. This same technology will also change the basic media and possibly the basic form of education; libraries are part of this process.

These products and services cost money; the libraries and their institutions will be facing serious economic decisions. It is to the benefit of the patrons and institutions to have the library staff,

administrators, and governing boards knowledgeable and informed about the services, benefits, and costs of available technology.